Vol. XXV. Part 12.

[Registered at the General Post Office, Melbourne, for transmission by Post as a Newspaper.]

The Journal of the Department of Agriculture of Victoria, Australia.

Dec., 1927.

PRINCIPAL CONTENTS

The Production of Choice Butter and Cheese

The Apple Export Industry

Pig-Feeding Experiment

Winter Egg-Laying Test

Water for Stock and Irrigation

Sulphuring and Spraying Vines

Standard Herd Test Quarterly Report

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VICTORIA, AUSTRALIA.

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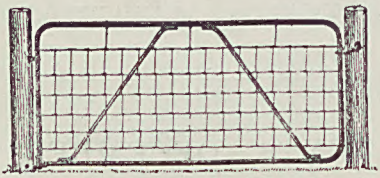

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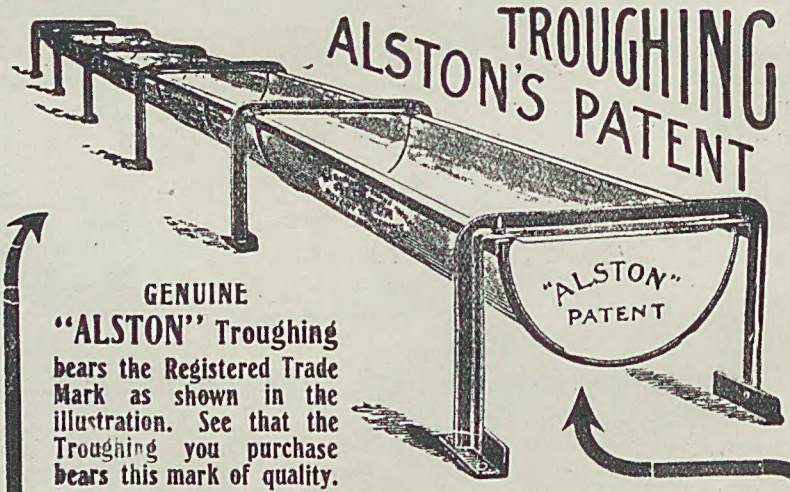

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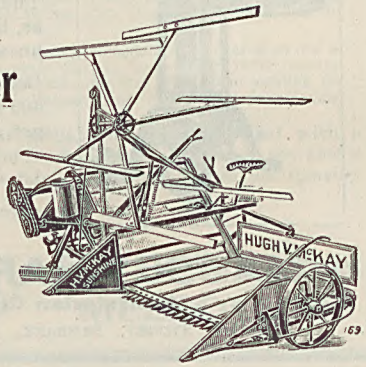

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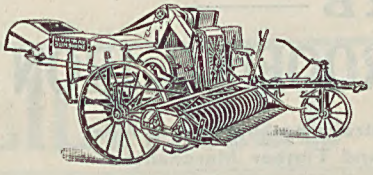

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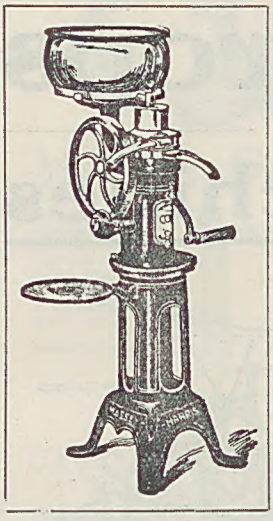

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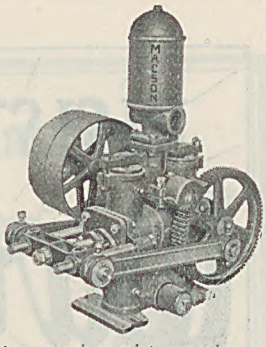

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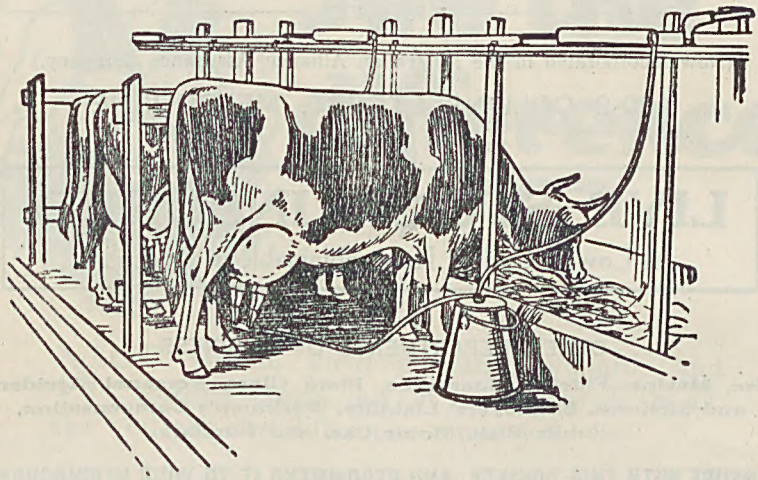

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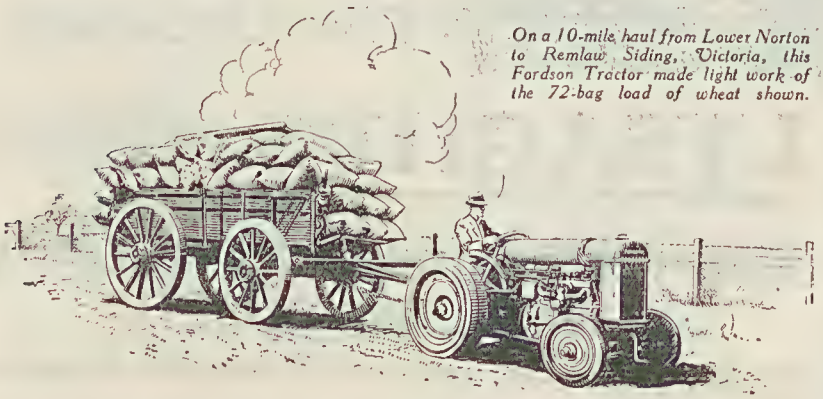

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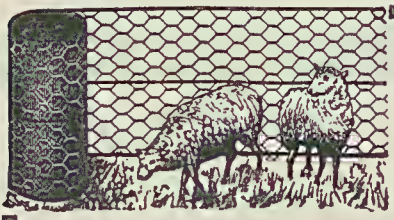

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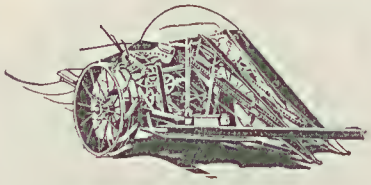

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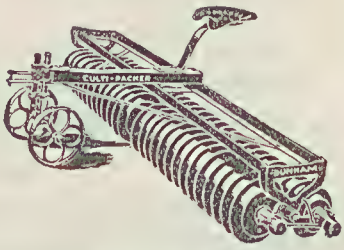

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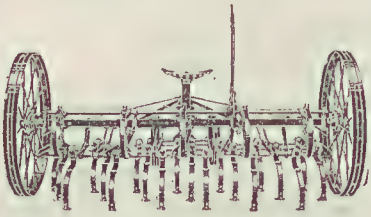

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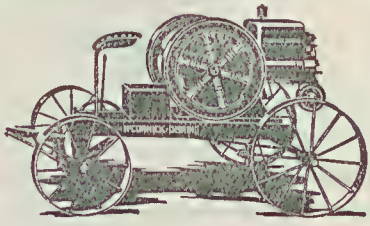

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THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XXV. December, 1927. Part 12.

THE PRODUCTION OF CHOICEST BUTTER AND CHEESE.

By R. Crowe, Acting Director of Agriculture.

In consequence of the late start, the prospects of the butter season are not good, and much less butter will be available for shipment from Victoria than was the case last season. It has been reported that lower grade points have been awarded to some unsalted butter than in previous years.

The use of boric acid is now prohibited; consequently greater care and cleanliness are necessary. Such advice, inferentially, implies that dairymen have not been as careful as they might have been. It is not intended, however, to convey the impression that this neglect is general, for the great majority of our dairymen are both careful and cleanly. In proof of this it may be stated that over 90 per cent. of the butter produced in Victoria is of choicest quality. It is the exceptional suppliers who must be spurred on to better efforts.

Australia and Denmark.

Most of those engaged in dairying here compare favorably with those in older dairying countries—not excluding Denmark. While in Denmark, I visited the dairy farm which possessed the best dairy herd in that country. There was an old bull and a young bull in the cowshed—and I was not impressed with the condition in which the shed was kept. Immediately in front was an untidy manure heap, across the yard was the back door of the dwelling house. There was plenty of mud between the gateways, as well as down the whole way along the cart track leading to the back of the farm, where the dairy cows were tethered. I had to pick my steps carefully, and if such

a place were here in Victoria, the local dairy supervisor would have some uncomplimentary remarks to make.

Mud is inseparable from a dairy-farm in the winter-time; in fact, one might almost say it is synonymous with money. A farm where no mud results from traffic is not suitable for dairying at all. One may have concrete floors in the milking-shed and all the yards, and between gateways, but when the cows step from these they will soon cause mud to form.

Where the Danes excel, however, is in the general adoption of scrupulous cleanliness in regard to their milk utensils. In milking operations there the cows' teats are, first of all, carefully washed with clean, tepid water. If the same water is used several times over, it may be more a contaminating than a cleansing medium. The buckets and milk cans are cleaned to the point of sterilization; the cream separator is taken to pieces, and similarly cleaned after each operation. I did not see any milking machines, but where they are used one may be sure that they are as carefully cleansed as any of the other utensils.

Absolute Cleanliness Essential.

The majority of dairymen in Victoria do likewise, and a group may be quoted whose methods are as excellent as those obtaining anywhere else in the world. Without exception, all the suppliers to Nestle's great milk condensory, near Warrnambool, adopt a standard of cleanliness not to be excelled. This is essential. More than a dozen dairy inspectors are employed by the company to see that every precaution is taken to prevent contamination.

Were it not for taking steps to ensure a pure, clean milk supply, a business such as Nestle's could not be successfully carried on. The milk used for their product must be free from inherent defects, which may not manifest themselves immediately after the milk is supplied, but which would do so before the product finally finds its way into consumption.

If a high standard of cleanliness can be generally adopted in one place or district, there is no good reason why all dairymen should not be able to rise to the same standard.

Some dairymen are careless for want of knowing better, whilst others make mistakes in all good faith.

I remember having trouble at a factory with over 200 suppliers. The butter was lacking in keeping qualities. It took some days to ascertain the cause. One supplier only was at fault, yet the total output of the factory was affected. And the mistake arose from an action that the supplier thought was for the best; she was only too pleased to adopt remedial measures immediately the need was pointed out.

Strange as it may appear, factory managers and buttermakers recognize that it is more difficult to make a uniformly high standard of butter with good keeping qualities in the spring of the year, or when conditions are apparently most favorable. There is an abundance of green grass, the temperatures are not too high, and so on.

Milk from Newly Calved Cows must not be used.

It is easier to make good butter in the summer, when high temperatures prevail. The reasons are that many dairymen are lax in their methods when the weather is cool; and, unfortunately, there are some who will use milk from cows too soon after they have calved.

Milk from cows the first day after calving will contain as high as 16 per cent. of albumen; and, by the third day, it comes down gradually till it is under 2 per cent. Normal milk contains less than 1 per cent. of albumen.

Any observant dairyman will know that butter made from the milk of cows that have just calved is wanting in keeping qualities. Milk given by cows up to the fourth day after calving should not be sent to the factory for butter or cheese-making.

Some Troubles could be Guarded against by Local Regulations.

A deputation of cheese-makers called on me recently, and asked that regulations should be made under the Dairy Produce Act giving power to prohibit the acceptance of tainted milk, or of milk containing more than .22 per cent. of acidity, and, further, that the delivery of milk at a factory after 9.30 a.m. should be forbidden. The reply given to each request was that provision would be made by regulation as far as possible.

Upon further consideration, however, I came to the conclusion that regulations such as indicated should not be necessary. Every purchaser of milk for butter- or cheese-making, or of cream for butter-making, has power to make rules or conditions in addition to those provided under Acts of Parliament and Government regulations. The manager can draw up rules and, after approval by the directors, acquaint each supplier.

The matters mentioned could all thus be provided for. For instance, there is no obstacle in the way of making a condition that milk for cheese-making will not be received after 9.30 a.m. This is necessary in the interests of all concerned. If milk is kept unduly waiting the commencement of operations, the whole lot may lose that condition essential for the production of a good article. In addition, time is required for the making of good cheese. It is unfair to expect the employees to work on in to the night seven days a week, for months at a stretch.

The question of expense also has to be considered. There is no reason why tainted milk should be accepted for cheese-making and put in with the bulk. Furthermore, there is no justification for accepting milk containing more than the maximum acidity suitable for making the best quality cheese. Why should one supplier be permitted to materially discount the quality and price of the product of all the other dairymen?

A condition regarding the acceptance of such milk could be framed—that it was to be received at a lower price, separated, and used for other purposes. Such action would be calculated to make the odd careless dairyman more careful, and bring him up to the standard of the others.

All Milk Should be Cooled.

The time has arrived when all milk should be cooled at once after milking operations, if it has to be delivered as fresh milk to a butter or cheese factory. Also, if it is separated on the farm, it should be immediately cooled.

The practice of cooling must come into operation, not on a single farm, or a number of farms, but on *all* dairy farms, since it is in the best interests of the dairy farmers themselves.

I know many householders who, during the winter-time (and even now,* when warm, muggy days are encountered), are careless in cleansing their milk-jugs. Consequently, they have more sour milk to discard than in the height of summer, when they practise more cleanliness. It is the same with dairymen in the country.

The Use of Boric Acid.

Following the recent issue of a circular to butter factories indicating that sodium hypo-chlorite was a poison, and that its use in excess in cream was responsible for rendering a whole consignment of butter valueless, I had samples of the butter which chiefly led to the issue of the circular, and of ten other suspected butters, taken for investigation by the Agricultural Research Chemist. He reports that chemical tests failed to reveal the presence of sodium hypo-chlorite, or free chlorine, in any of the samples.

The history of the parcel of butter mainly responsible for the statement in the circular is interesting. It is known to have been made twelve months ago, and that it had, for various reasons, been sent to several places.

For a long time the value of sodium hypo-chlorite for use in sterilizing drinking water has been known. During the Great War it was adopted by British armies for sterilizing drinking water, with the result that they suffered a less proportion of casualties from water-borne diseases than in any previous war. Its use is recommended by the British Ministry of Health for treating suspected water. Nearer home, Swan Hill has its water supply sterilized by this means.

Sodium hypo-chlorite is made by passing a direct electric current through salt water; that is, brine. It may also be produced by other means.

It has been used extensively on dairy farms for the thorough cleansing of dairy utensils and, particularly, milking machines. It is also used generally in butter factories for the cleansing of utensils, and is especially useful in connexion with wooden churns, leaving the wood white and free from taint.

All last season, a few butter factories used it experimentally in cream at the time of churning as a sterilizing agent, and not as a preservative, with very beneficial results.

When so used, it is applied in the proportion of 10 c.c. of a 10 per cent. soluton to 1,000 lb. of cream. This is equal to one part of the hypo-chlorite to 500,000 of cream.

* Written in October, 1926.

On the assumption that the butter absorbed the whole, a person would need to consume about half a ton of butter fresh from the churn at one sitting to get even a medicinal dose of sodium hypo-chlorite. In other words, as the annual consumption of butter is about 30 lb. per head per annum, it would take nearly 37 years for one to receive a medicinal dose if treated butter were consumed at each meal throughout that period.

As a matter of fact, a certain proportion of the hypo-chlorite would pass away in butter-milk and wash waters, and a further portion would be used in sterilization. That small portion remaining would probably be dissipated, as sodium hypo-chlorite is an unstable substance when exposed to the air. Experiments have shown that, even when a very large excess of hypo-chlorite was used, the chlorine taint, perceptible at first, disappeared after the course of a few days. It can be safely stated that, in the proportions used, no perceptible amount of free chlorine nor hypo-chlorite will remain in the butter, and no harm is likely to come to the consumer.

Supplementing the announcement, which created somewhat of a scare, a correspondent took the opportunity to gain further publicity for his theory that the use of chemical preservatives was claimed by some to have a bearing on the cause of cancer.

In Denmark, where boric acid is not used in butter, the percentage of deaths from cancer is higher than in any other country, numbering 140 per annum per 100,000 persons living.

This is 52 per cent. higher than the rate in Australia, where boric acid has been used.

The consumption of food with preservatives added within the prescribed limits, has never been proved to be injurious to health. On the other hand, it is significant that the large increase in ptomaine poisoning which occurred in England this year has arrested attention. If people choose to eat less palatable food, and run the risk due to the absence of preservative, no one can take exception to their doing so.

Consignments of bacon have gone bad, and have been returned to the country whence they came. Hitherto, it was usual to include boric acid in the brine, to prevent the bacon from becoming slimy and unsaleable.

As far as the dairymen and butter-makers in Australia are concerned, the prohibition regarding the use of boric acid in butter for export will be rigidly adhered to. At the same time, considering the long period which elapses before our butter finds its way into consumption, efforts will continue to be made to ascertain how far any discoveries of science may be applied towards its preservation, bearing in mind all the time that health considerations are paramount.

THE APPLE EXPORT INDUSTRY.

By J. M. Ward, Horticultural Superintendent.

The Coming Season's Prospects.

Owing to unfavorable weather conditions, coupled with that now well-known pest—thrips—last season's apple crop in Victoria was very light. The total was only 550,000 cases, of which less than 10,000 were sent overseas, whereas during the 1925-26 season over 2,000,000 cases were harvested and 500,000 of these were exported. Thus it can be easily understood that apple-growers and the State as a whole suffered a severe loss during the 1926-27 season. The present crop promises to be a record one for Victoria, and there is every indication of an export of over half a million cases. The crops in Tasmania and South Australia are also heavy, but that in Western Australia is comparatively light.

Competition in the sale of apples in Australia promises to be very keen. The fact that Western Australia will ship a much smaller quantity to the United Kingdom during the forthcoming season should, to some extent, benefit the shippers in the remaining export States.

There is a second factor, too, that may help. According to reports received, the American crop is only from medium to light, and this may lessen the export of apples from the United States to Great Britain. If this be so, the Australian exporter should be further benefited.

The Great Necessity for Attractive Packing.

Owing to the publicity given to Australian apples in England, our fruit is now better known than ever before; but, when the English public is being told by the ever-increasing advertisements to eat more Australian apples, we must back up the publicity campaign by delivering to England and Europe the very best article, put up in the most attractive manner.

This attractive manner means that the apples must be carefully picked and handled whilst in the orchard and packing shed. Greater care must be exercised in grading for quality and in the sizing of the fruit. We must put the fruit in a more attractive case. Unfortunately, there are thousands of cases exported from Victoria and other States that are anything but attractive in appearance, and this, according to buyers on the other side of the world, tends to lessen the value of the fruit contained in the case.

During the past two or three years we have made many improvements in the general "get-up" of our apples; still we are a long way from the standard set by our Western Australian and New Zealand competitors. Victoria is an older fruit-exporting country than either Western Australia or New Zealand, yet exporters in both places pack their fruit in a manner more pleasing to the public than we do. Maybe they have profited by our mistakes, and we are too blind to see or too conservatve to acknowledge our weaknesses.

As a matter of fact, the packs of most of our growers are creditable. But, unfortunately, there are a number of growers who do not yet realize that only the very best should be sent away to a distant market, where it will have to compete with fruit carefully packed so as to please the eye. It is this minority that keeps the reputation of Australian fruit at a lower level than it deserves. To obtain that higher price which makes the difference between profit and loss, we must exert every influence to overcome those defects in grading and packing that exist, in a greater or less degree, in each district of the State.

Why do Western Australian Apples bring a Higher Price than those from Victoria?

A few days since I had a visit from a well-known Western Australian apple-grower, who exports a large percentage of his crop to overseas countries, and he informed me that he has sold a large number of his export apples at prices ranging from 9s. to 12s. per case, f.o.b. I have not heard of any Victorian grower who has made sales at such prices.

The same grower, after visiting some of our apple districts, expressed surprise at the methods in many of the packing sheds. He saw only one or two nailing-down presses and very few case-conveyors, and he suggested that it was a close adherence to old-fashioned methods that was the reason why Victorian growers received, on an average, 3s. per case less than at least one Western Australian grower.

Victoria produces high-quality apples, which, after being kept in cool storage for six to nine months, realize fairly high prices in Melbourne late in the season, and similar apples from the same orchards should bring at least as good a price in the overseas markets as those produced in Western Australia.

Yes, I have taken into consideration the fact that our apples are in the ship's hold for about a fortnight longer than those from Western Australia. That is not an adequate explanation of the difference of 3s. per case between the prices of apples from the two States.

A Packing Competition.

Several of our public men who have been to England have suggested that we should improve our pack. With a view to bringing about this improvement, Mr. H. G. Colonbie, who represents a number of English fruit firms, has presented a valuable silver cup to be competed for by apple-growers who export. All who ship from Victoria will be competitors, and the fruit will be judged at the ship's side. The grower who averages the highest number of points during the season will be presented with the cup and will retain it for twelve months, or until another grower wins it from him. Any one winning it three times will become the owner. Each winner will also receive a small replica of the cup. There will, in addition, be three cash prizes—one of £15 15s., one of £10 10s., and the third £5 5s. The judging will be carried out by departmental officers.

The maximum points to be awarded are 100—50 for the appearance of the case and presentation of the fruit when the case is opened, and the other 50 for wrapping, grading, quality, and colour. Further details of this competition can be obtained on application to the Department of Agriculture.

The presentation of this cup and the cash prizes should help to bring about an improvement in our pack.

Immature Apples Should Never be Exported.

Many growers innocently pick their apples for early shipment whilst they are in an immature condition, and consequently lack quality. Upon arrival in England they probably meet with a ready sale, but the dissatisfaction of the buyer may be reflected in the price received for later shipments. Perhaps it would be a good thing if our first shipment were delayed for about a week or ten days later than usual. I have a number of reports on these early shipments; one of them reads as follows:—

> "The first direct steamer to arrive at this port (Liverpool) this season from Australia and Tasmania was the s.s. *Ascanius,* the cargo of which was practically all disposed of at two auctions.
>
> Unfortunately, colonial fruit has again to contend with important quantities arriving from the United States of America, and, in consequence, the opening quotations this season are well below the prices realized for the first consignments last year.
>
> The quality of the fruit by the *Ascanius* from the mainland and Tasmania leaves a good deal to be desired. Many varieties showed signs of 'pit,' but the worst feature we had to contend with was that many samples contained fruit more or less shrivelled or spent, and others a quantity of waste."

Let us hope that reports such as this will not be made so far as Victoria is concerned. Let every grower lay himself out to pick his fruit in a manner that will be a credit to himself and his district. The growers in the Gippsland district are now banding themselves together with a view to improving their pack and general export business, and they are to be congratulated upon their initiative. Should success result from their efforts, other districts will, no doubt, follow their lead. The Department of Agriculture will continue to assist those growers desiring assistance by way of instruction in grading and packing.

SOUTH AFRICA'S INCREASED CITRUS EXPORTS.

Nearly 1,000,000 boxes of oranges were exported from South Africa to the United Kingdom and Continental markets during the 1927 season. The previous year's figure was 700,000 cases. It is expected owing to increased production that the export will reach 1,500,000 boxes in 1928.

THE SHIPPING OF APPLES.

TEMPERATURE CONDITIONS IN REFRIGERATED HOLDS.

One of the questions which has been investigated by the English Department of Scientific and Industrial Research is the temperature conditions in refrigerated holds conveying apples, and towards the end of last year the British Government issued a report on the subject by Dr. A. J. M. Smith, M.A., of the Low Temperature Research Station, Cambridge. Extracts from that portion of the report of interest to fruit-growers and exporters have been made by Mr. G B. Tindale, B.Ag.Sc., of the Victorian Department of Agriculture, and are printed hereunder, together with a few comments by Mr. Tindale on our Australian fruit export.

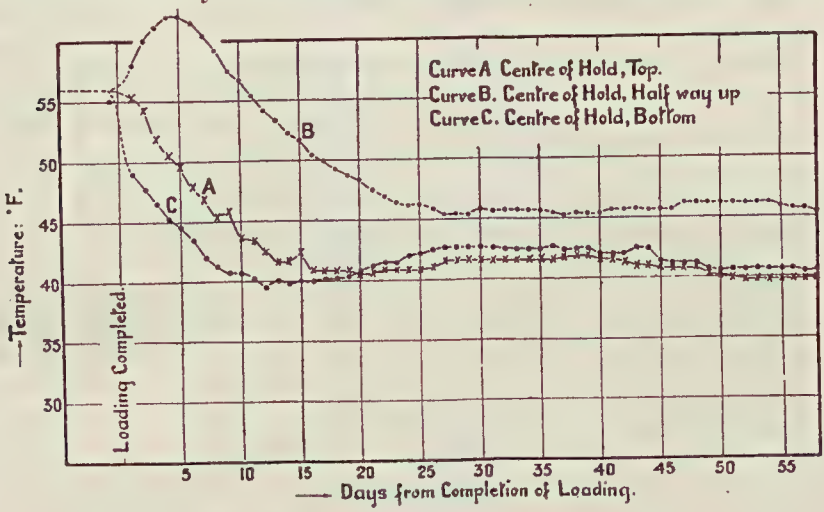
There is no doubt that the condition in which Australian apples reach the European markets calls for considerable improvement. Although the subject has been discussed for many years, it is only recently that any data has been available concerning the temperature conditions in holds of boats carrying apples. That lack has been met by the information in the report of the party of scientists which, a couple of years since, at the instance of the Department of Scientific and Industrial Research of Great Britain, visited Australia, and made investigations regarding the temperature conditions in holds which carried apples from Tasmania to England.

In Dr. Smith's report, it is remarked that "fruit occupies an anomalous position among refrigerated cargoes, since, unlike meat, butter, eggs, and most other produce, it is shipped in a warm condition. In cooling down the warm fruit to the required temperature for carriage, the ship is asked to undertake a task outside the range of her normal function as a carrier of produce already refrigerated."

"In those circumstances, the refrigerating plant operates under a double disadvantage. In the first place, its actual refrigerating capacity, more than adequate for the demands made upon it in the carriage of cargoes already frozen or chilled, is not always sufficient for the severe task of rapidly cooling a large cargo of hot fruit. Secondly, it is extremely difficult, if not impossible, to distribute a large amount of refrigeration uniformly amongst a closely-stowed mass of fruit cases. In consequence, the whole of the refrigeration available cannot, as a rule, be employed without a grave risk of freezing those parts of the cargo nearest the cooling pipes or the cold air trunks, although the interior of the mass of fruit may still be quite warm. Instead of going "All out" in cooling down the cargo, the ship's engineer can do no more than maintain its outer boundaries at as low a temperature as he dares, and wait for the slow penetration of refrigeration inwards."

"The difficulties are increased by yet another circumstance, again peculiar to fruit cargoes. In addition to the heat brought into the hold by the warm fruit in the first instance, the latter is actually generating heat the whole time it is in the ship. Moreover, the higher the temperature the more rapidly is heat generated. If left in the hold without refrigeration, the cargo would get hotter and hotter, and in this way would rapidly destroy itself. Even with strong refrigeration, it has

been found that the cases of fruit remote from the brine pipes or air trunks may actually rise in temperature by several degrees before refrigeration has penetrated to them in sufficient amount to neutralize the heat which they are themselves generating." (See graph below.)



Present Temperature Conditions.

"A great variability exists in the temperature conditions in different parts of the hold. The expression, "the temperature of the hold" is indeed quite meaningless, for there is not one temperature in the hold, but many. The warmest and coolest portions of the hold usually differ by at least 10 deg. F., and sometimes by as much as 20 deg. In cooling, part of the fruit is brought down to the required temperature in two or three days, and thereafter may be in considerable danger of freezing."

"Other portions remain warm for weeks after loading, and sometimes are loaded in England only a few degrees cooler than when they left Australia."

"Although direct evidence is at present wanting, it is clear from small-scale experiments that these differences of temperature must be reflected in the condition of the fruit. For instance, apples carried at 45 deg. in the centre of the hold must ripen more rapidly than similar fruit, which may be carried at 32 deg. near the grids or the cold air trunk. The variability in the consignment of Australian fruit, so often commented upon by importers, may be due, in a considerable measure, to such circumstances."

Methods of Refrigeration.

In dealing with the system of refrigeration now obtaining, Dr. Smith states that the "systems with air circulation would naturally be expected to show better results than the simple grid system, with regard to rapidity of cooling and uniformity of temperature. Actually, however, this is not so, and the grid system holds its own with any of its rivals in these respects. Further, in holds with the grid system, circulation of the air by means of an auxiliary fan and trunk system is found

to have comparatively little effect on the temperature. In fact, it appears to be almost impossible thus to drive air uniformly for any considerable distance through a closely-stowed mass of fruit cases. The air flow is localized along certain paths, and big inequalities of temperature still persist."

"A limited improvement in the temperature conditions would doubtless be attainable by employing stronger air circulation of the present type, but the whole problem is not to be solved in such a simple manner."

"In addition to the forced movement of the air, there is also movement due to temperature differences. Where the air is relatively cold, it tends to fall, and where it is warm it tends to rise. Cold air introduced at the top of the hold will tend in this way to sink through the cargo to the bottom, and if the movement is sufficiently unimpeded, a fairly uniform distribution of refrigeration can thus be achieved."

Dr. Smith then goes on to say that, at present, only horizontal air channels are systematically provided on the majority of ships, and that these serve little purpose, as the cold air will not pass along these horizontal channels. He states that the air channels should be vertical. This is not easy to arrange for in stowage of the cargo, and suggests nailing on small wooden slats to two sides of the case, when it is being made.

In discussing the question of stowage, Dr. Smith says:—

"Much of the bruising of the fruit, which is caused by cases being walked over during loading and discharge, could be avoided were the cases stowed on end instead of on the flat side." "Doubts have been expressed," he says, "as to the stability of a cargo stowed in this way, but the suggestion seems one well worth testing by means of an experimental shipment."

Dealing with thermometer readings on board ship, Dr. Smith states that "one of the most striking facts revealed is the disparity between the readings of the ship's thermometer, and the actual temperatures of the fruit in different parts of the hold. Actually, as has already been mentioned, the temperature is far from uniform, and in one and the same hold the difference between the regions of highest and lowest temperatures may be from 10 to 20 degrees. The ship's thermometers do not record these extreme values. This is because they are not situated at the points of critical interest. In particular, it is impossible to locate thermometers of the present type amongst the fruit in the centre of he hold, which is almost invariably the region of highest temperature."

For these reasons it is suggested that the present method of temperature measurement ought to be supplemented at once, and perhaps eventually replaced altogether by the provision of electrical distant-reading thermometers, which can be placed in position while the cargo is being loaded at points which would otherwise be inaccessible to temperature measurement."

Pre-Cooling.

In writing of cooling before shipment, Dr. Smith says:—

"While it is certain that the maximum potentialities of rapid cooling on board ship have not yet been realized in practice, it is frankly

conceded that the task of cooling down a cargo of warm fruit is so formidable that really satisfactory results may never be obtainable under the limitations imposed by considerations of space on board ship. The alternative is to cool the fruit before shipment. In refrigerating chambers on land, space is of less vital importance, so that looser stowage can be employed, and refrigeration can be more uniformly and hence more rapidly, distributed. The separate consignments can be cooled piecemeal as they arrive from the orchard."

"Incidental delays in shipping will find the fruit quiescent in cool storage instead of exposed to the sun's heat. The ideal system would be to cool the fruit while it lies on the wharf awaiting the arrival of the overseas steamer."

Desirability of Rapid Cooling.

On this phase of the subject, Dr. Smith writes:—

"It will probably be objected at this point that the rapid refrigeration here advocated, whether on ship or before shipment, cannot really be necessary, since many of the cargoes shipped under the present conditions apparently land in England in good condition. To this, the immediate answer is that, "scientifically, little is actually known as to the condition in which cargoes do arrive at the present time, except in cases where a considerable fraction of the whole shipment is spoiled. It is clear, however, that even in what would at present be called "good" shipments, there is often a proportion of avoidable damage due to over-ripeness and similar causes, the elimination of which would justify considerable changes in the present methods."

"It is, however, not merely the necessities of the present, but even more the possibilities of the future, that will occupy minds alert to improve the conditions of the trade. At present, the fear of landing fruit in an over-ripe condition prevents the cautious grower from shipping fruit which would otherwise be a profitable venture."

"The same circumstance decrees that much of the fruit which is shipped must be gathered from the tree at a relatively immature stage, with the result that its full flavour and aroma, and often its full size and colour are never attained."

"With more rapid refrigeration, it is probable that the fruit could be left longer on the tree, and still arrive in England without being over-ripe, and with its attractiveness and value considerably enhanced."

At present, our export trade is practically confined to apples, but local experiments and experience in our own cool stores show that other fruits such as the softer varieties of pears, plums, grapes, and probably peaches, could be successfully exported, but before this trade can develop, it is essential that the temperature of carriage be maintained within very exact limits. Hence the futility of attempting to ship these fruits in a hold mixed with warm apples. Should all fruit for export be cooled before shipment, it should be quite a simple matter to build up a large export trade with these more perishable fruits.

In South Africa, where all fruit for export is pre-cooled, notwithstanding the fact that the journey to England occupies only about three weeks, a very extensive trade is being built up with pears, plums, grapes, peaches, &c.

There is no doubt as to the great possibilities if once such a trade was developed here, for it should be remembered that the European market is quite bare of these fruits at that time of the year, when those grown in Australia would arrive there, whereas with apples, growers are meeting with increasing competition from the carry-over of cool-stored American apples.

The Advantages of Pre-Cooling Shipments from Australia.

Having in mind what Dr. Smith says of the advisability of cooling fruit before shipment, and in view of the conditions in which many cargoes of Australian fruit reach their destination, the advantages of pre-cooling may be summarized as follows:—

If cargoes are pre-cooled, the temperature at which the fruit is carried can be controlled within very exact limits. Hence over-ripeness would be avoided, and fruit would be landed in a condition practically the same as that in which it is loaded on board ship.

Fruit which arrives in a uniformly superior condition naturally fetches better prices, which benefit the grower, shipper, &c. Next, by pre-cooling our fruit it would be a simple matter to develop a trade with the more perishable fruits, such as the softer varieties of pears, plums, grapes, and peaches.

Pre-cooling would also greatly facilitate handling at the ship's side, for the exact requirements in full trucks could be forwarded from the cool store to the ship's side.

Inspection also would be greatly facilitated, for this could be done at the cool store instead of at the ship's side.

Another feature worth mentioning is the fact that if pre-cooling was adopted it would be a simple matter to hold back portion of the season's crop and thus extend the marketing season.

SILK AND EXPLOSIVES FROM MAIZE-STALKS.

According to a recent press report, the problem of commercial utilization of maizestalks is believed to have been solved after many years of effort. The process of Dr. Bela Dorner, a Hungarian chemist, has been brought to the United States, tested by experts, and pronounced practicable and economical. By this method artificial silk has been produced from maizestalk pulp. The technical obstacles have been the pith and knuckle of the stalks, which could not be removed economically. The Dorner process grinds up the entire stalk, which means that it is possible to convert a waste material into abundant supplies of pulp for making paper, artificial silk, motion-picture films, explosives, celluloid, lacquers, artificial leather, pyralin, and other products. Now the maize belt farms destroy annually more than enough stalks to supply the pulp requirements of the United States. By-products of the Dorner process can be used in the manufacture of alcohol, cattle feed, butanol, furfural, lactic acid, &c. These by-products will be an additional revenue.

PIG FEEDING DEMONSTRATION

At the Wangaratta Agricultural High School Farm.

R. T. Archer, Senior Dairy Inspector, and A. J. Gill, Senior Herd Tester.

By the co-operation of officers of the Education Department and of the Department of Agriculture a demonstration in the fattening of pigs was recently carried out at the Wangaratta Agricultural High School. The experiment was made with a litter of pure-bred Middle Yorks. Mixed feed was fed dry to them in an open trough; water was supplied in a separate trough. A careful record of the kind and quality of the food consumed was kept.

The object was to demonstrate that satisfactory results could be obtained with pigs running out in the open and fed a dry balanced ration; the adoption of this method of feeding means a reduction in

Fig. 1.—Litter of Pure Middle Yorks.

the labour required. It had been intended to use an automatic feeder, but one was not obtained until too late. The consequence was that more feed had to be supplied, for some of that fed was rooted out on to the floor. It was not lost altogether, for it was cleaned up and fed to sows, but it means that the total quantity of feed debited to the pigs experimented with is higher than it should be.

Owing to the dry season there was no green feed available; this meant that the cost of the open-air system was greater than it would be in a normal season. Experience proves that where green feed is available for grazing the grain requirement is much reduced. It is our opinion that if we are to compete with bacon-exporting countries open-air feeding will have to be introduced so that the cost of production may be reduced. Any green food, such as grass, clover, lucerne, tares, peas, oats, barley, &c., is satisfactory. Artichokes are likely to be particularly useful, as the pigs will root them out for themselves, thus saving labour.

The Result of the Experiment.

The full details of the experiment are given below, and some interesting results are disclosed.

Four barrows and four sows were fattened. They were born on 8th January, and were weighed and ear-marked on 17th March, when

they were 68 days' old, their total weight being 248 lb., an average of 31 lb. During the period of the experiment they were weighed once a month. In the first month the average daily gain was .91 lb., for the second month 1.33 lb., for the third month 1.54 lb., and during the last month 1.6 lb. Their final weight on the 29th July at the age of 172 days (24 weeks 4 days) was 1,380 lb., an average of 172.5. The average live weight after starving over night was 168.75 lb., which meant a loss of 2.22 per cent. Dressed weight averaged 131.25 lb., showing an average loss of 22.23 per cent., which is comparatively low. The average weight of cured bacon was 101.62 lb., or 77.42 per cent. of the dressed weight, and 60.22 per cent. of the live weight.

It was found that, on an average, 3.72 lb. of food was required to produce 1 lb. live weight, and the cost of the food worked out at

Fig. 2.—Carcases of Litter shown in Fig. 1.

1.14d. On a farm where the bulk of the food could be grown the cost would not have amounted to more than ¾d. per lb.

The pigs were sold to the Wangaratta Bacon Factory at 9d. per lb. dressed cooled weight. The manager said they killed out remarkably well, the comparatively small loss being due to good feeding. The quality of the bacon was very good, except that it was generally too fat, one pig in particular having nearly 3 inches of fat on the shoulder.

The total cost of the food required during the period of the test was £20, and a further 10s. per pig (£4 in all) should be allowed for food consumed before they were weaned. As the price received from the factory was £39 7s. 6d., the profit was £15 7s. 6d., or if 1d. per lb. be allowed for labour, interest, &c., the profit may be set down at £11.

Another litter has since been farrowed by the same sow, and a feeding experiment with these has just commenced. It is intended to cross the sow with a Large White boar, and to carry on the first cross.

Fig. 3.—Half of an excessively Fat Carcass (up to 3 inches of back fat).

The Wangaratta High School has now a pure Large White boar and sow, and soon will have pigs for sale, which it is hoped will have a very beneficial influence on the production of bacon and pork in the district.

Our thanks are due to Mr. Thomson, the principal of the school, for his assistance, and also to Mr. Murphy, the farm manager, for the trouble he went to in weighing the pigs and recording their weights, and in keeping a record of the different kinds of feed that were used during the experiment.

Details of Weights at different periods of Litter of Middle York Pigs used in Feeding Experiment at the Wangaratta Agricultural High School, with dressed weights, etc., and details of food consumed, etc.

1927. Born 8th Jan.		Date of 1st Weight 17th Mar. Age 68 days.	2nd Weight 8th April, 22 days.		Age 90 days. Increase Per Day.	6th May 3rd Weight, Age 118 days. 28 days.			3rd June 4th Weight, Age 146 days. 28 days.			29th July 5th Weight, 26 days. Age 172 days. 24 wks. 4 days.			1st July Weight after starving overnight.	Per Cent. Loss.	Dressed Weight.	Per Cent. Dressed to Starved Live Weight.	Weight of Cured Bacon.	Per Cent. Cured to Dressed Weight.	Per Cent. Cured to Live Weight.
Sex.	No.		Weight.	Increase.		Weight.	Increase.	Increase Per Day.	Weight.	Increase.	Increase Per Day.	Weight.	Increase.	Increase Per Day.							
		lb.	lb.		lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.			lb.		lb.		
S.	136	36	57½	21½	·97	97	39½	1·41	145	48	1·71	191	46	1·77	188	1·38	145	77·12	111	76·55	59·04
S.	137	34	55	21	·95	90	35	1·25	130	40	1·42	175	45	1·73	172	1·66	133	77·32	103	77·44	59·88
B.	138	33	55	22	1·00	96	41	1·46	139	43	1·53	183	44	1·69	179	2·19	140	78·21	107	76·42	59·78
S.	139	33	52½	19½	·88	90	37½	1·34	139	49	1·75	179	49	1·88	176	1·68	137	77·84	105	73·13	59·65
B.	140	29	47	18	·81	83	36	1·28	120	37	1·32	149	29	1·11	146	1·35	114	78·08	90	78·94	61·50
B.	141	23	40½	17½	·79	79	38½	1·37	124	45	1·60	165	41	1·57	159	3·64	124	77·98	97	78·22	61·00
B.	142	32½	56½	24	1·09	94	37½	1·34	137	43	1·53	175	38	1·46	171	2·29	136	79·53	105	77·20	61·40
S.	143	27½	45	17½	·79	80	35	1·25	122	42	1·50	163	41	1·57	159	2·46	121	76·10	95	78·51	59·74
Average		31	51½	20·12	·91	88·62	37·5	1·33	132	43·37	1·54	172·5	41·6	1·6	168·75	2·22	131·25	22·23	101·62	77·42	60·22

Ration consisted of Pollard, 50 lb.; Crushed Barley, 30 lb.; Oats, 20 lb.; Meat Meal, 10 lb.; Linseed Cake Meal, 8 lb. Pollard, 1s. 9d. per bushel; Barley, 4s.; Oats, 3s. 6d.; Meat Meal, 16s.; Linseed Meal, 16s.; Bone Flour, 16s. Cost, 1·14d. per lb. Food consumed, 4,216 lb. = £20. Initial weight, 248 lb. Total final weight, 1,380 lb. Net gain, 1,132 lb. Cost for food per lb. live weight gain, 4·244d. Food consumed per lb. live weight gain, 3·72 lb.

Food cost	£20 0 0 ..	1,050 lb. at 9d. =	£39 7 6
Eight pigs at 10s.	4 0 0 ..		
Labour, interest, &c., at 1d. per lb...	4 7 6 ..		
Balance	11 0 0 ..		
	£39 7 6 ..		£39 7 6

EGG-LAYING COMPETITION.

THE WINTER TEST.

By W. C. Rugg, Chief Poultry Expert.

What Should be the Period of a Winter Test?

Recently there has been some discussion amongst poultry-men in the various States as to over what period a Winter Test should extend. Suggestions have been made that it should be only for the months of April, May, and June—a period of 91 days—instead of including as well the month of July, which would make the number of days 122. This latter period was the one accepted by the Victorian Department of Agriculture seventeen years ago.

Every commercial poultry-man knows that the amount of profit he is likely to make on his year's operations will, in a great measure, depend on whether or not his pullets lay a large number of eggs during the winter. The poultry-farmer must look to the young birds to carry him over the lean period that is inevitable every year, caused by the older birds ceasing to lay when they gradually go into moult during March, April, and May; in fact, probably it is July ere the whole flock is back into full profit. Therefore, it is the pullets that must provide, not only the cash to buy feed for themselves and the moulting birds, but also to meet overhead expenses. The Department, knowing this, decided, when drawing up the regulations to govern the Burnley Egg-laying Competition, to offer special certificates for the several winners in the Winter Test. It was desired to encourage the production of birds capable of laying large numbers of eggs at the time of the year when new-laid eggs command the highest prices; in this State that season is from April to July. The average weekly prices for eggs during those months for the last seven years have been as follows:—

Month.	1st Week.	2nd Week.	3rd Week.	4th Week.
	s. d.	*s. d.*	*s. d.*	*s. d.*
April	2 3	2 5	2 6	2 7
May	2 7	2 7	2 7	2 7
June	2 7	2 6	2 4	2 1
July	1 11	2 0	2 0	1 10

In working out these averages it was not thought wise to go back further than 1920 owing to the abnormal conditions that obtained then for some years as a result of the war.

It will be seen from the high prices obtained in July that, as far as Victoria is concerned, it would be a mistake to omit that month from the Winter Test.

The Value of Classifying Eggs by Weight.

When the 1927-28 Competition commenced, the opinion was expressed by a number of breeders that the pullets entered were, with few exceptions, superior to any birds sent for any previous Burnley Competition. There is not the slightest doubt that this improvement in size and stamina is due to the regulation that provides for the weighing of every egg laid. Breeders now are paying more attention to selecting

their breeding stock each year, for they know that, if the required size of egg is to be consistently produced, each bird must be of the standard weight for the breed, and must possess a sound constitution. Without these two conditions it is impossible for the curator of the competitions to get satisfactory results from competitors, no matter how much attention and good feed he lavishes upon them.

The 1927 Winter Test.

1st April to 31st July.

A notable feature of this year's Winter Test was the establishment of a new official record at Burnley for a team of six birds in four months, and it is, as far as is known, a world's record. This record was made by six Black Orpington pullets entered by the Wingood Poultry Farm, Kew. These six pullets laid 643 eggs in 122 days—an average

Winning Team in Winter Test.
(Laid 643 eggs in 122 days. Owner—Wingood Poultry Farm, Kew).

of 107⅙ eggs per bird. By the 31st July this pen was 176 eggs in the lead of the second pen, and indications then were that, by the time the 48 weeks' competition is concluded, that lead will be increased. Not only did the Wingood Farm win the Champion Certificate in the Heavy Breed Section, but also the first and second prize certificates for the highest individual scores in the Team Tests. Hen No. 2 of the Wingood team laid a total of 117 eggs, all of first grade; hen No. 4 laid 103 first grade eggs and 14 of second grade. What makes the performance of this team all the more creditable is that the birds were not housed in covered pens, but were running in an open yard exposed to all weathers, and last winter was a severe one, more frost being experienced than in any previous competition at Burnley.

The owner of the birds, in writing to me in reference to his success, says that he attributes it largely to the sending of a team to Burnley every year, and selecting for his breeding pens the birds that have laid well in the competitions. He adds that a contributing factor was "the efficient manner in which Mr. Macauley and his assistants looked after the birds."

The winners of the second prize certificate are owned by Mrs. D. Mason, of Ringwood. They laid 467 eggs, only 6 of which were of second grade. They are a really good lot, and were somewhat unfortunate in meeting such formidable opponents as the winners proved to be.

The champion certificate for Light Breeds was won by the Rosette Poultry Farm, Lower Ferntree Gully, with a fairly even team that laid 469 eggs, only 10 of which were second grade. I believe this is the first occasion the Rosette Farm has entered for the Burnley Competition, and at present it would appear that its team will still be in the lead when the year's competition concludes. If this team be properly mated,

No. 2 Bird in the Winning Team.
(Laid 117 eggs, all first grade, during the period of the Test—122 days).

they should breed birds that will take a prominent place in future competitions.

The second prize certificate in this section was won by the veteran breeder, Mr. W. Cullen, of Werribee. His team laid 461 eggs, of which only 6 were second grade.

First certificate for the highest score by an individual bird in the competing teams in the Light Breeds Section was won by the Rosette Poultry Farm. The winner laid 94 eggs, all of first grade. The second certificate was awarded to Mr. W. H. Bamford, of South Australia; in this case the total number of eggs was 93, of which 2 were second grade.

In Section B, Light Breeds, Single Test, the champion certificate was won by Mr. T. A. Mentiplay, of Somerville, whose White Leghorn hen, in the Wet Mash section, laid 102 eggs, 3 of these of second grade.

The second prize was won by Mr. H. Beet, of Barham, New South Wales, with a White Leghorn in the Dry Mash section, which laid 98 eggs, only one of which was of second grade.

In the section for Heavy Breeds, Single Test, the champion certificate was awarded to Mr. J. Taylor, of North Brighton, whose Black Orpington hen produced 111 eggs, 2 of them of second grade.

The second prize certificate in this section went to Mr. J. A. Naylor, of Alphington. In this case the number of eggs laid was 107, all of first grade; the value of the eggs was £1 1s. 6d. A hen belonging to Mr. H. J. Taylor laid an equal number of eggs, all, too, of first grade, but worth a penny less than those produced by Mr. Naylor's bird.

Mr. W. Cocking's Light Sussex.
(Laid 110 eggs during the period of Test).

The fourth highest number of eggs laid by a bird in the Single Test section was 110; these were produced by a Light Sussex owned by Mr. W. Cocking, of Mickleham. Unfortunately, 33 of them were of second grade, and thus failed to win a certificate. When the Winter Test closed this bird had laid 89 eggs in as many days, and she continued to lay an egg per day for the next 32 days. A total of 121 eggs in as many days is a record sequence at the Burnley Competitions. I am glad to say that the weight of her eggs is improving. Mr. Cocking informs me that the mother of this hen laid a 2¼-oz. egg, and the sire's dam also laid eggs of 2¼ oz. and over. Both parents have won prizes on the show bench.

The complete prize-list is given on the following page.

Records of Prize Winners—Winter Test.

SECTION A.—Groups of Six Birds Trap-nested.

—	Name and Address of Competitor.	Pen No.	Bird No.	No. of Eggs. 1st Grade.	2nd Grade.	Under-weight.	Total.	Value. £ s. d.	Breed.
				Light Breeds.					
				SIX BIRDS.					
First Prize (Champion Certificate)	Rosette Poultry Farm (C. J. Ratz), Burwood and Dobson roads, Lower Ferntree Gully.	6	..	459	10	1	469	4 13 1	White Leghorn
Second Prize (Government Certificate)	W. Cullen, Werribee Poultry Farm, Werribee	2	..	455	6	..	461	4 12 0	,, ,,
				INDIVIDUAL BIRDS.					
First Prize (Champion Certificate)	Rosette Poultry Farm (C. J. Ratz), Burwood and Dobson roads, Lower Ferntree Gully	6	4	94	..	1	94	0 18 10	White Leghorn
Second Prize (Government Certificate)	W. H. Bamford, 74 Adelaide-road, Glenelg, South Australia	1	3	91	2	..	93	0 18 5	,, ,,
				Heavy Breeds.					
				SIX BIRDS					
First Prize (Champion Certificate)	"Wingood" Poultry Yard (T. A. Goodwin), 8 Peel-street, Kew	35	..	602	41	..	643	6 6 3	Black Orpington
Second Prize (Government Certificate)	Mrs. D. Mason, Waterloo-street, Ringwood.	32	..	461	6	1	467	4 13 10	,, ,,
				INDIVIDUAL BIRDS.					
First Prize (Champion Certificate)	"Wingood" Poultry Yard (T. A. Goodwin), 8 Peel-street, Kew	35	2	117	..	..	117	1 3 5	Black Orpington
Second Prize (Government Certificate)	"Wingood" Poultry Yard (T. A. Goodwin), 8 Peel-street, Kew	35	4	103	14	..	117	1 2 10	,, ,,

Prize Winners—*continued.*

SECTION B.—Individual Birds. Single Test.

—	Name and Address of Competitors.	Pen No.	Bird No.	No. of Eggs.				Value.	Breed.
				1st Grade.	2nd Grade.	Under-weight.	Total.	£ s. d.	
Light Breeds.									
First Prize (Champion Certificate)	T. A. Mentiplay, Somerville ..	36	..	99	3	..	102	1 0 3	White Leghorn
Second Prize (Government Certificate)	H. Beet, Box 44, Barham, New South Wales *viâ* Kerang	92	..	97	1	..	98	0 19 8	„ „
Heavy Breeds.									
First Prize (Champion Certificate)	J. Taylor, 376 Point Nepean-road, North Brighton	206	..	109	2	..	111	1 2 1	Black Orpington
Second Prize (Government Certificate)	J. A. Naylor 449 Heidelberg-road, Alphington	193	..	107	..	..	107	1 1 6	„ „

WATER FOR STOCK AND IRRIGATION.

By W. R. Jewell, M.Sc., B.Met., F.I.C., F.A.C.I., Agricultural Research Chemist.

The importance of a plentiful supply of water of good quality, both for stock and for irrigation, needs no emphasis. Most farmers know this to be a fact from their own personal experience. Cases in which crops and orchards have been spoiled, and stock killed by the use of unsuitable water have been investigated by the Department's Chemical Laboratory, and numerous samples of water are submitted yearly for analysis to determine their suitability for stock and irrigation. Unfortunately, many samples have to be condemned, and by having them analysed before use farmers have been saved serious loss, and useless expenditure on pumping plant, &c. The main object of this article is to explain briefly the terms used in reporting analyses, to explain why certain waters are unsuitable, and why it is impossible to improve or purify them, and to show how the farmer can benefit by having doubtful samples submitted to the Department's laboratory for analyses and advice.

Water, of course, is one of the most important of chemical compounds, as it enters largely into the composition of all living matter. Animal bodies contain from 40 to 70 per cent. of water and plants up to 90 per cent. Water is also one of the simplest chemical compounds, being a combination of the two gases, oxygen and hydrogen. It readily dissolves many substances, and it is because of this property that we frequently find dangerous quantities of mineral salts in solution. Rain, as it falls, dissolves gases from the air, and small traces of mineral matter from dust. When rain water, melted ice or melted snow passes over or through the soil, many mineral salts are dissolved, and the character and taste of the water are changed. If the water has passed through layers of earth containing common salt and other salts it may become so heavily charged with these substances as to be useless for irrigation and stock. The question as to how the salt got into the soil is one which need not be discussed here. Other minerals containing lime, magnesia, &c., make the water hard and unsuitable for laundry and steam raising purposes. Few inland waters are as highly mineralized as sea-water, which contains about 3½ per cent. of solid matter, mainly common salt, in solution.

In reporting an analysis of water, it is usual to express the results in parts per 100,000, or in grains per gallon. The Laboratory of the Victorian Department of Agriculture adopts the former method. The first value given is the "total solids" left on evaporation of the water. This figure expresses the total amount of solid material in solution, the major portion of which is mineral matter, although organic matter may also be present.

The amount of chlorine in the sample is estimated and reported as such, and also calculated as common salt or sodium chloride. This is because chlorine is a constituent of common salt, and the amount of chlorine present is therefore an indication of the amount of salt, the

most usual combination of chlorine found in water. As will be shown later the salt content is of great importance in waters for both stock and irrigation.

Sulphates are reported as the amount of sulphate radicle present. High sulphate content acts in a similarly injurious manner to salt in irrigation water, and may have a purgative or scouring action on stock. Carbonates and bicarbonates are reported as their respective radicles and, if excessive, cause hardness in water while the carbonates and bicarbonates of soda form the dreaded lack alkali in soils.

The foregoing are known as acid constituents. The basic constituents, e.g., lime, magnesia, soda, &c., are frequently determined and are reported as such. It is possible to combine the basic radicles or constituents with the sulphate, carbonate, &c., and report the amount of various salts assumed to be present. This is a more or less arbitrary proceeding and may be misleading, as in most waters salts do not occur as such, but as separate radicles or constituents. Therefore, this procedure is not normally adopted in reports from the Laboratory of the Victorian Department of Agriculture.

Water for Stock.

Salt, in excessive amounts, acts like a poison, and animals should not be allowed access for any length of time to strongly saline or brackish water. Unfortunately, many of our bore waters are saline, and for that reason must be rejected for certain stock. To decide whether such water is suitable for cattle it is necessary to know the limit of salt allowable for different classes of stock.

It is impossible to fix absolutely hard and fast rules, as toleration for salt depends on a number of factors. Stock accustomed to saline water will drink, without ill effects, water which would be deleterious to other stock. On the other hand, stock accustomed to fresh water may be adversely affected by water containing a comparatively small amount of salt. If cattle are feeding on succulent herbage they naturally require less water, and therefore their drinking water may be more saline than that supplied to stock fed on dry herbage. The tolerance of stock for salt varies when at rest and when working, when grazing and when droving. In one case eight horses were watered on saline water for three or four weeks while at rest. When put to heavy work seven of them died. Cases are recorded in Queensland of heavy mortality in sheep after using water containing 500 parts of salt per 100,000, while in Victoria and elsewhere some sheep are known to do fairly well on water containing nearly twice this amount of salt.

It will therefore be apparent that exact limits cannot be laid down, but from experience in Victoria the following standards have been adopted as a guide:—Water containing up to 300 parts of salt per 100,000 is considered safe for working horses and dairy cattle, and probably for pigs. Water containing from 300 to 1,000 parts of salt is safe for sheep and grazing cattle, provided that when the salt exceeds about 700 parts of the water should be used in cases of emergency for short periods only. Water containing more than 1,000 parts of salt per 100,000 cannot be recommended for stock at all. The maximum amount

of salt found in samples of water sumbitted to this laboratory was 3,400 parts per 100,000. This water was more salt than sea-water, and was obviously useless for stock of any kind.

The deleterious effect of high sulphate content has already been mentioned. Little is known of the effect of alkali carbonates on stock, but in the amounts usually found in bore waters, no harm appears to be done.

Having reported adversely on a saline water, one is frequently asked the question: "How can this water be improved, and what treatment do you recommend?" Unfortunately, there is no practical method by which the salinity can be removed or reduced to within safe limits. It cannot be subjected to chemical treatment as in the case in softening hard waters. Pure water can be obtained from salt water by distillation and condensation, but this method is obviously impracticable on a large scale. So that if a water is too salt nothing can be done to remedy it.

Water for Irrigation.

Although the following remarks apply to all irrigation waters in general, is is not suggested that the water used in the large irrigation schemes in Victoria is questionable. One has in mind private bores used for irrigating small orchards, or watering the farm garden. Samples of these frequently submitted are quite unsuitable for irrigation purposes.

The permanency of irrigation agriculture depends on an assured and ample supply of water of good quality. Soluble mineral salts and suspended matter both may be deleterious, since they may injure the soil chemically or physically. In Victorian bore waters for irrigation, salt again is the most important factor. It is well known that it does not need a very high concentration of salt in the soil to kill vegetable life, some plants being more susceptible than others. The use of slightly saline water may result in the accumulation of salt in the soil until it reaches a serious concentration. The amount of salt allowable in a water for irrigation depends partly on the nature of the soil and partly on the other salts already present in the soil. In heavier soils, e.g., clay loams, salt would readily accumulate near the surface, and it would be difficult or impossible to wash out the saline accumulations from time to time, as would be feasible in light sandy soils.

Generally speaking, however, it may be stated that the limit for salt in irrigation water is practically the same as that allowed in potable water, i.e., an extreme limit of about 70 parts of salt per 100,000. Waters containing a greater concentration of salt should not be used for plants. Sulphates act somewhat similarly to salt, but to a lesser degree.

Alkali carbonates and bicarbonates (i.e., of soda), often called black alkali, are more serious than salt in their effects on plant life and on the soil, but unfortunately, few of our bore waters contain black alkali in appreciable amounts. Black alkali is not only more toxic than salt to plant life, but it also has a deleterious action on the soil, altering its physical condition, and, in extreme cases, making it unfit for cultivation by causing it to puddle in wet weather and to dry into hard masses after

dry spells. The maximum amount of carbonate of soda permissible in water for irrigation can be taken as between ten and twenty parts per 100,000, depending on the nature of the soil and the amount of water applied.

The ill effects of mineral water on plant life are chiefly due to concentration of the salts in the soil, and even from waters containing only small quantities of mineral salts, dangerously high amounts may be left in the soil after repeated irrigations in hot dry weather. These salts would not be removed until heavy rain fell, and then only if the ground were porous and well drained. So that even with slightly mineralized waters, the effects on soils and crops should be watched, and the water never applied in excessive amounts.

The foregoing remarks do not by any means cover the whole question of water for stock and irrigation. It would be impossible in a short article to treat the matter exhaustively, or to do more than touch on some of the more salient features. There are also many aspects too technical and involved for a popular article of this nature. It is hoped, however, that the importance of ascertaining the quality of water for these purposes has been stressed, and that the benefits to be derived from having doubtful samples analysed are clear.

The Department's Chemical Laboratory can be of assistance to farmers in this, as in many other directions. Samples of water, about a beer bottle full, may be submitted to the Department for analysis and advice. A nominal regulation fee of 10s. 6d. is charged per sample. Further, the farmer can assist in collecting evidence with regard to the use of saline waters by reporting instances where stock is successfully watered with obviously brackish water, or where animals have died, or plant life has been destroyed by the use of saline water.

THE STOCKING OF RYE AND CLOVER PASTURES.

A correspondent from the Goulburn Valley asks:—Is it advisable, after watering a pasture of rye and clover, to leave it unstocked for a considerable time? My method is to restock as soon as a paddock will carry stock, and stock in such a way that the feed is just ahead of the number being grazed.

The reply is:—Your policy in regard to pasture is the correct one. Mixed grasses and clovers must be kept down to get the best results; the short growth is more nutritious and more palatable than the more mature growths. Stock will neglect the well-grown patches in a pasture and concentrate on the shorter and "sweeter" grasses. Experiments show that young pasture grazed always presents a far better sole than does pasture when a crop of hay is cut and the aftermath grazed.

SULPHURING AND SPRAYING VINES.*

By F. de Castella, Government Viticulturist.

Between now and vintage time the vine is liable to attack by several enemies, both insect and fungous. From these, protection is usually easy, provided proper means are applied and at the proper time, but neglect or inattention may lead to severe damage, if weather conditions are suitable to the spread of one or other of the more usual pests of the vine.

The chief fungous diseases we have to reckon with are Oidium or Powdery Mildew, Downy Mildew, and Black Spot or Anthracnose. Among insects and their allies we have the Vine Moth Caterpillar, the Lecanium Scale, and Erinose. Bulletins are obtainable from the Department of Agriculture, which deal with fungous diseases of the vine, but a few reminders will not be out of place.

Phylloxera is, of course, the most redoubtable of all vine pests, but it is not amenable to direct attack. Once it arrives in a district we can outflank the enemy, so to speak, only by growing vines grafted on phylloxera-resistant stock. We thus make up our minds to live with the phylloxera and in spite of it.

Now, however, I shall deal with enemies that can be combated by sulphuring and spraying.

Oidium or Powdery Mildew.

We sulphur vines mainly to protect them from the oidium fungus (*Uncinula spiralis*), but the treatment has other beneficial effects that must not be lost sight of.

Oidium, or Powdery Mildew, as it is called in America, a name that aptly describes its appearance, is a fungus that has been with us for many years. True, it is distinctly less redoubtable to-day than some 30 years ago for reasons that are by no means clear. Towards the close of last century sulphuring was a regular practice in our vineyards; neglect of it usually meant more or less severe injury to the grape crop. To-day sulphuring is often omitted without any very marked detriment to the yield. The fungus is, nevertheless, with us. It is still capable of injuring the grapes, and actually does more harm than it is generally credited with, lowering the grade of sultanas and often injuring table grapes. In suburban gardens it is one of the commonest causes of faulty grapes, the disfigurement and even splitting of the berries that it may bring about being only too familiar.

Its life history cannot be fully gone into here. Suffice it to say that it is epiphytic, living on the outside of the vine tissues, and for this reason within reach and easily destroyed. Another peculiarity is that it does not need wet weather for its spread; high air humidity suffices; in other words close, muggy, warm weather, but without rain.

The standard treatment consists in three applications of sulphur in powder form—one shortly after sprouting, the second at blossom, and the third and subsequent ones if necessary, should the fungus be noticable, in December and January. The time for the first two has now passed, but the third and subsequent ones should receive attention on the first sign of the fungus in the vineyard.

* Notes of a "wireless" talk delivered 2nd December, 1927.

The Value of Sulphur in the Vineyard.

Apart altogether from oidium control, sulphuring has a beneficial action on the vine that is not sufficiently recognized. Applied at blossom, this all-important function is stimulated and a better setting of fruit results. Later on in the season it has a marked tonic action on vegetation. Sulphured vines are of a darker green and more healthy colour, and they ripen their fruit earlier. This has been conclusively proved in Southern France. Oidium first appeared there in the early 'fifties, and in the mild climate proved very virulent. Sulphur was soon found to be the remedy, and its generous application became the rule in all vineyards. Records show that, since the introduction of the sulphur bellows, the average date of the commencement of vintage was advanced by about a fortnight. Two or three sulphurings in December and January, should advance maturity by at least a week, a gain that makes the sulphuring well worth while. Even though oidium should not make its appearance at all, sulphuring is recommended on account of the other benefits the vine derived from it.

Sulphur is also of great use to control Erinose, sometimes described as Warty Leaf, caused by a microscopic mite, a rather recent introduction that has caused much alarm and occasionally some damage to Gordo Blanco and Doradilla vines. Two or three sulphurings in summer will effectually check its spread.

But too much must not be expected of sulphur. Though of great value for the purposes just mentioned, it will not kill caterpillars, and is useless against Downy Mildew and Black Spot.

The Application of Sulphur.

Much might be said concerning the different forms of sulphur.* All are good, provided they are in sufficiently fine powder. If coarse, it falls off the vine surface and is wasted. If fine, the bulk of it adheres. Fineness is thus of far greater importance than purity. Certain trade mixtures containing less than 50 per cent. of sulphur may thus be more efficacious than pure sulphur in too coarse a powder. Some of these contain a small percentage of copper sulphate, enabling them to serve a dual purpose—against Downy Mildew as well as Oidium. These are distinctly useful to supplement the sprays to be described presently. They must not, so far as Mildew is concerned, be looked upon as substitutes for them, however.

Sulphur may be applied in various ways. The hessian bag sometimes used in suburban gardens is clumsy and wasteful. It frequently inflames the eyes of the operator, an accident that can be remedied by a very simple eye-wash—half a teaspoonful of baking soda in a large tumbler of water. The old-fashioned sulphur bellows is much better. Better still is the Knapsack sulphurer, which permits more even and more economical distribution of the powder. For vineyard sulphuring on a large scale, horse-drawn, wheel-driven machines are now obtainable capable of treating 20 acres a day.

Vines may be sulphured at any hour of the day. At one time it was thought necessary to apply in the very early morning only "when the dew is on." This is not now considered necessary. It is true that in early morning the air is very still, and this is an advantage; wind militates against the even distribution of the sulphur.

* See Bulletin No. 50, *Oidium of the Vine*, p. 20. Obtainable on application to the Department of Agriculture.

Spraying for Downy Mildew and Black Spot, etc.

We spray vines for various reasons—mainly against Downy Mildew and Black Spot, against which sulphur is of no avail. We also spray against certain insect visitations. As regards Downy Mildew, weather conditions a few weeks ago promised to favour a bad outbreak. A warning was sent out, the response to which was very gratifying. Most vineyards were sprayed. As things worked out, the outbreak did not materialize, but it was a near thing. Temporarily, we seem safe enough, but everything depends on weather conditions, and on these it is never safe to gamble.

The main thing to remember is that Downy Mildew differs radically from Oidium, not only in the treatment it demands, but in its mode of life. Oidium being epiphytic, or outside the tissues, can be cured. Not so with Downy Mildew, which is endophytic. Cure is impossible, though prevention is fairly easy, if it be in good time.

Heavy rains may render immediate spraying advisable at any time. Even if no rain should fall, a January spray, directed mainly to the foliage, is highly desirable. Early defoliation by Mildew or any other cause has disastrous results. The sugar of the fruit is entirely manufactured in the vine leaves: without these the fruit cannot ripen.

Foliage destruction has, however, more far-reaching consequences than the spoiling of the coming crop. It would, in addition, seriously compromise next year's crop—that of February-March, 1929. The year's cycle of activity does not end, for the vine, with the ripening of the grapes. In addition to this, reserves must be stored up for the start of next year's growth in the wood and roots. A vine prematurely de-foliated has poor reserves, and there will be a scanty "show" of fruit next spring. The pernicious practice of turning stock into the vineyard, as soon as the grapes are picked, is always at the expense of part of the following season's crop. It cannot be too strongly condemned.

Exactly similar results follow defoliation by Downy Mildew. It is for this reason that a January spray is so very desirable.

Bordeaux mixture, as described in the bulletins of the Department of Agriculture is the standard spray against Downy Mildew and Black Spot. Proprietary mixtures are quite good if supplied by reliable firms. Bordeaux should contain 2 per cent. copper sulphate and 1 per cent. of first class quicklime; in other words, 10 lb. bluestone and 5 lb. lime to 50 gallons of water. Five ounces casein dissolved in a little water with ½ oz. of caustic soda is an excellent spreader. Weaker mixtures, such as are used in our orchards, are not strong enough for vines. Further details will be found in the departmental bulletins.* Wherever signs of black spot are noticed vines should be sprayed with Bordeaux. Do not wait for January. The same spray is effective against both fungi.

Insect Pests.

Against insect pests other sprays must be applied.

The caterpillar of the vine moth, *Phalænoides*, is only too well known in suburban gardens. Strange to say, it does no harm in the

* See Bulletins Nos. 42 and 49. Obtainable on application to the Department of Agriculture.

open vineyard. An arsenate of lead spray 1 lb. to 25 gallons water will immediately clear a trellis of caterpillars.

Another vine pest common in Melbourne suburbs is the Vine Scale. *Lecanium Berberidis.* At this time of the year nicotine sulphate, 1 pint to 80 gallons, will destroy the minute insects hatching out of the eggs, to be found under the old scale shields. Observe when the young insects are on the move and spray immediately.

Conclusion.

Such are the main reasons for sulphuring and spraying vines in the near future. The points I want particularly to draw attention to are—firstly, the desirability of reverting to the old practice of sulphuring vines, not only for oidium control, but also on account of its tonic action on the vine; secondly, the advisability of a Bordeaux spray in January to protect against Downy Mildew and premature defoliation of the vines.

FEEDING POULTRY FOR EGG PRODUCTION.

By W. C. Rugg, Chief Poultry Expert.

The subject of feeding fowls for the production of profitable numbers of eggs is one that, during the last fifty years, has been talked of and written of by hundreds of scientists, poultrymen, dealers, and schemers in almost every country in the world, and, in more recent times, much valuable information has been acquired by research as to the value of certain grains, meals, and green foods.

In our own State, during the last few years, a great deal of knowledge has been gained by practical feeding experiments at the Werribee Research Farm. The experiments have been closely watched by poultry-farmers, and the published reports have called forth a great number of letters of appreciation. These tests are caried out, not with the idea of dictating to the experienced poultry farmer what he shall or shall not feed, but with the object of showing the inexperienced poultry-keeper the most economical and safest methods of feeding to ensure profitable returns. We cannot guarantee that similar feeding to that tried in the experiments at the Research Farm will give like results in every part of the State; climatic and other conditions will, of course, cause variation.

Though many commercial poultry-farmers claim to get better returns than we do, our results can be recommended to the beginner as a starting point. If after some experience he finds a better system than that we recommend he can adopt it.

Feed—Good Wholesome Foods and Nothing More.

In spite of the fact that the Department of Agriculture has been demonstrating for the last six years at the Research Farm, that profitable numbers of eggs can be obtained only by using plain, wholesome foods, there are always many budding poultry-farmers seeking "get-rich-quick" methods; they think there is some magical way by which

birds, irrespective of their quality or the treatment given them, can be made to lay large numbers of eggs. This ridiculous notion is fostered to some extent by the poultry press, and nearly every beginner, when he gets his first attack of "hen fever," will read everything he can get hold of that deals with his hobby, and, unfortunately, in many cases, will believe all he reads.

According to some advertisements, every little while a wonderful way of getting more eggs is discovered, usually by the use of some spice, condiment, or some specially-prepared food, which is generally put on the market with a great flourish. Probably it is said to contain an element or elements which will make hens lay nearly double the number of eggs they did before, and usually testimonials, more or less reliable, are not lacking. One I read recently surely points the road to fortune. Under the heading "Eight Extra Eggs per Bird in a Month," is a testimonial from a writer with a very distant address. It reads, "Not knowing much about fowls I started as an experiment with three hens which I procured cheap, and thought I had done well to get two or three eggs weekly from each bird. Being advised to try your ———, I did so, and your ——— is certainly all you claim it to be, as I am now getting an average of five eggs weekly from each bird. You may use this letter in any way you wish."

This may be perfectly true, but it is the sort of thing that upsets the beginner. I can assure them of this—I am proud to say I number amongst my friends some of the largest egg producers in the State—and I do not know of one that uses spices, condiments, or forcing foods of any kind. We also have in the managers of the egg-laying competitions in this State men who know as much about feeding for high egg production as probably any men in the world, and I do not know of one that advises the feeding of anything but plain, wholesome meals and grains. They know there are no short cuts, and that their sure road to success lies in keeping their birds in perfect health, and this can be done only by good, plain, wholesome feeding, without stimulants. From what I know of some of our largest egg producers they would not let slip the chance of making their birds earn another £500 per month if those spices and condiments would do on every farm what some of the advertisements would lead one to believe. The price of eggs at present, 24th October, 1927, is probably as low as it will be this year, and yet there is more than one farm in Victoria on which an additional eight eggs per bird per month would increase the income by from £500 to £700 a month.

At the Royal Show, in September, I exhibited, in the Government Pavilion, samples of the different varieties of foods used at the Burnley competition and at the Research Farm at Werribee. The display consisted of bran, wheat, pollard, barley pollard, oaten pollard, lupol, lucerne chaff, meat and milk, wheat, oats, maize, barley, shell grit, charcoal, bone meal, succulent green stuff in rye grass, silver beet, red clover, green oats, green barley, and green lucerne.

In the last egg-laying competitions at Burnley a Leghorn hen, belonging to Mr. Mentiplay, laid 334 eggs in twelve months, and a Black Orpington, of Mr. Cullen's, laid 338 eggs. A team of six Black Orpington pullets, owned by Mr Goodwin, have just made a world's record for a winter test, laying 643 eggs in 122 days, or an average of 107 eggs

per bird. All these results were obtained by using a selection from the foods named above. This should be sufficient to show the inexperienced poultryman that so-called aids to egg production are unnecessary when good quality foods are fed to the birds in bright, clean, sanitary houses.

Another exhibit that attracted a lot of attention was the display of the actual amount of food consumed by one hen in twelve months and the number of eggs she laid.

All the meals, grains, &c., were shown separately in kerosene tins. The reason for using this measure was that it is the common one of most poultry-farmers. If one talks to many of them of, say, 30 lb. of pollard, they do not get as good an idea of the quantity as they would if one gave the measure as, approximately, one-and-a-half kerosene tins full (which is, roughly, about 30 lb.). This particular exhibit showed the average amount of food consumed by each of 50 hens in a feed test, at Werribee, extending over twelve months. In this test each bird ate, on an average, 86 lb. 4 oz. of food, costing 9s. 3¼d. The average egg production was 180.5 eggs, which realized £1 3s. 0¼d., showing a profit over cost of food of 13s. 9d.

The 86 lb. 4 oz. of food was made up as follows:—Bran, 7 lb. 6 oz.; pollard, 14 lb. 12 oz.; dried butter-milk, 4 lb. 5 oz.; wheat, 26 lb. 10 oz.; oats, 13 lb. 4 oz.; maize, 13 lb. 4 oz.; barley, 6 lb. 10 oz. It is estimated that each bird also consumed two kerosene tins of succulent green stuff. Shell grit, charcoal, and water were always available. In almost every feed experiment carried out by me the amount of food consumed per bird, in a year, has varied considerably. On one occasion it was as low as 80 lb., and, on another, as high as 110 lb., but the figures I have quoted will give poultry-keepers a fair idea of how much food they must provide for each laying pullet over a period of twelve months. A greater variety of meals is desirable, and would, in all probability, result in a larger number of eggs being laid.

Succulent Green Feed a Necessity.

I would like to take this opportunity of denying a statement that has appeared in a section of the press to the effect that I condemn lucerne chaff as a food for poultry. This I have never done, for I know that both lucerne chaff and lupol, if of good quality, are excellent foods, but what I have said at many lectures to poultrymen is that they should plant successional crops of succulent green stuffs to keep their birds supplied all the year round, and that lucerne chaff, soaked or steamed, will not give such good results as fresh green stuff. I made that statement many years ago, well knowing it to be true, and that opinion has been supported by the results of an experiment carefully carried out by Mr. Clark at the Research Farm. This experiment extended over a period of ten months and twelve days—1st May, 1926, to 12th March, 1927. Four pens of 50 birds each were housed and fed under exactly the same conditions, with the exception that No. 1 pen was fed succulent green stuff, while No. 2 was allowed lucerne chaff steamed in the mash and soaked and fed as green feed, No. 3 pen was fed sprouted oats, and No. 4 pen was given no green feed at all.

The results were as follows:—The pen fed succulent green feed laid 7,883 eggs, valued at £52 16s. 8d.; the pen given lucerne chaff laid

7,425 eggs, valued at £47 4s. 6d.; the pen fed sprouted oats laid 6,743 eggs, valued at £43 5s. 8d.; and the pen fed no green stuff laid 6,610 eggs, worth £41 14s. 4d. So for that period of a little over ten months the pen allowed succulent green feed laid eggs to the value of £5 12s. 2d. more than that fed lucerne chaff. But what will interest poultrymen more is the fact that, during the months of May, June, and July, when prices for eggs were the highest for the year, the pen fed on fresh green stuff laid 697 eggs more than that fed lucerne chaff, and these eggs realized £6 11s. 9d. more than the eggs laid by the birds in the lucerne chaff pen. During the spring—August to November—the pen given lucerne chaff gained a little on them, but this was during the months of low prices for eggs.

I again repeat that no man can get the best returns from his birds unless he provides ample green feed throughout the year. Many poultrymen are like some of our dairymen. As long as Providence is good and sends the rain, and the grass or green stuff grows, well and good; if not, the birds, like the cows, have to live on the recollections of the last good season till the next one comes along, their owners making no effort to provide green food during the time of scarcity, which is usually late autumn and early winter, the very time when the prices for new-laid eggs are high.

In conclusion, I would strongly advise all poultrymen that ample ventilation should be provided for the layers during the approaching hot weather. Far too many birds were lost last year from heat prostration. A space should be left along the back wall, just under the roof, to allow of a free current of air. Even though poultry-houses may be open-fronted, that is insufficient ventilation. The roof should, if possible, be left cool, and I know of no better way than having an open space, the full length of the house, close to the roof. During the hot part of the day, which is usually between 2 p.m. and 4 p.m., it is worth while spraying the litter with water; this will cool the air; and if the dust baths are moistened, the birds will enjoy scuffling in the damp dust, and it will help to lower the temperature of their bodies. Remember it is the heavy layer that usually goes down first with the heat, because this is the bird with a large appetite, and consequently she feels the heat most.

WHEN TO MANURE LUCERNE.

A correspondent asks:—Is it advisable at this time of the year, when manuring a lucerne paddock, to manure with super. before or after watering?

The following reply has been furnished by the Senior Irrigation Officer:—When lucerne top-dressing is carried out in the growing season, it is better to do the work immediately after cutting and before watering. The manure is effective only when it gets into the soil solution, and, if it is applied after watering, it will lie on the surface till the next irrigation or till rainfall without being available to the plant. There is very little chance of the manure being carried along from the head of the bays by the moving water.

ABNORMAL EGGS.

By H. F. Clinton, Assistant Poultry Expert.

There are a great many forms of abnormality in eggs; among them are the eggs that are double-yolked, triple-yolked, and soft-shelled; there are eggs showing blood spots and others with meat spots; sometimes an egg will contain no yolk, and they may be of all sorts of sizes and queer shapes. They are all very interesting from a scientific point of view, but, because of the rarity of their occurrence, they are of relatively little practical significance to the poultry-keeper. However, the subject is discussed from time to time, and it is hoped that the following notes on some abnormal eggs will be of interest to readers of the *Journal*.

Fig. 1.—The shell of the inner egg can be seen through the hole in the shell of the outer egg.

An Egg Within an Egg.

An egg of this description was recently submitted for inspection by Mr. H. McColl, of Lower Ferntree Gully. It was laid by a Black Orpington in her second year. The "outer" egg (which contained two yolks) measured approximately three and nine thirty-second inches long by two and three-sixteenths inches wide. The thickness of the shell, including membranes, measured (dry) approximately one eighty-fourth of an inch; thus the shell would be described as thin.

In Fig. 1 the "inner" shell can be seen through the small hole in the "outer" shell. Fig. 2 is an X-ray photograph of this abnormal egg, kindly taken by Mr. E. F. Feurer at the Melbourne Hospital.

Mr. Lambert, a member of the Microscopical Society of Victoria, informs me that at one time in Queensland he saw an egg within an egg; it had been laid by an emu.

The occurrence of such an abnormality can be easily explained. A normal egg was almost ready to be laid, when, owing to a nervous condition induced by fright or some other cause, the egg was returned some distance back along the oviduct. In passing once more down the oviduct another layer of albumen and shell would be formed around the normal egg, so completing a freak specimen.

Fig. 2.—An X-ray photograph of the egg in which a smaller egg is enclosed.

Eggs of Abnormal Size.

Records of abnormally large eggs have been brought under the notice of the Department on various occasions. Some years ago an egg laid by a White Leghorn was submitted by a breeder; though it weighed 6¼ oz. it contained only one yolk.

In September, 1924, Mr. T. Condon, of Messrs. Foley Brothers Limited, Melbourne, brought to the Department a very large egg laid by a White Leghorn. It measured approximately 3⅝ inches by 2⅜ inches, and weighed just a shade over 7 oz.

A Triple-Yolked Egg.

On the opposite page is an illustration of a triple-yolked egg which was laid by one of a small flock of White Leghorns, belonging to Mr.

E. C. Cole, of East Malvern. This egg was one of several laid by the same bird within a week or so. A few days afterwards the bird was killed, and on being opened three yolks in the same stage of development were found in the ovary just about to be passed into the oviduct.

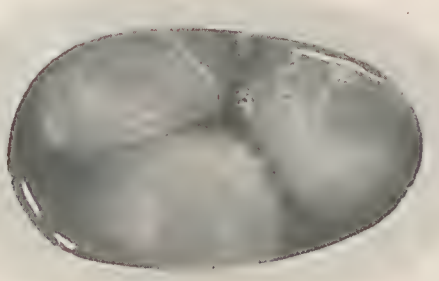


Fig. 3.—A triple-yolked egg.

MILK AND SCURVY.

Writing in a recent issue of *Forschüngen und Fortschritte,* Professor L. F. Meyer, of the University of Berlin, recalls the great increase in scurvy among children in Germany in the lean years that followed the world war.

I was able (he writes) with my colleagues to establish the cause of this increase. During the inflation period there was a lack of fresh fruit and vegetables, but this was not the sole cause of the increase in scurvy; it was ascertained that the milk for the children of the big cities lost in the process of long-distance transport, preservation, and pasteurization the scurvy-preventing quality natural to it. Porpoises, which are easily brought up on fresh cow's milk, fell victims to scurvy within two or three weeks when fed on town children's milk. On the strength of this the demand was made for fruit juices to be more liberally supplied in order to make up for the deficiency of the anti-scorbutic vitamin C in the milk and for a child's milk worthy of the name containing this vitamin to be supplied.

Other sorts of milk were tested for their anti-scorbutic property—*i.e.*, their content of vitamin C. Our researches showed that the addition of mother's milk to their food kept porpoises free from scurvy, and this bore out the fact already observed that breast-fed children never fall victims to scurvy. Goat's milk on the other hand, even when quite fresh, contains only traces of vitamin C. This is interesting in connexion with the fact that infants fed on goat's milk not infrequently suffer from grave forms of anæmia, which may be due to the poverty of the milk in vitamin C. In any case, these researches show that goat's milk must not be regarded as a perfect substitute for cow's milk.

STANDARD HERD TEST.

Report for Quarter ended 30th September, 1927.

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 395, of which 258 qualify for the certificate.

The amount of butter fat required for qualification varies according to the age of the animal (up to 5 years at time of calving), the standards being as follow :—

Junior 2 year old (under 2½ years at time of calving)	200 lb. butter fat.
Senior 2 year old (between 2½ and 3 years at time of calving)	225 lb. butter fat.
Junior 3 year old (between 3 and 3½ years at time of calving)	250 lb. butter fat.
Senior 3 year old (between 3½ and 4 years at time of calving)	275 lb. butter fat.
Junior 4 year old (between 4 and 4½ years at time of calving)	300 lb. butter fat.
Senior 4 year old (between 4½ and 5 years at time of calving)	325 lb. butter fat.
Mature cow 5 years and over	350 lb. butter fat.

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. H. Adams, Amey's Track, via Foster	1	..	Ayrshire	Ruby of Dunachton ..	Mature	7374	29.9.26	210	4	4,875	3·83	186·63	350	
H. Allez, Moama, via Echuca	8	2	Friesian	Gladfield D.P. Queenie ..	Jr. 4 yrs.	App. 4	28.9.26	273	7	5,583	3·56	198·70	300	291
				Gladfield Peerless Posch ..	Sr. 2 yrs.	2180	15.10.26	273	6½	8,120	3·27	265·56	225	262
				Gladfield Pluperfect Posch ..	Jr. 2 yrs.	App. 3, Vol. 7	26.10.26	273	4	5,825	3·79	220·98	200	
				Yorkshire Dominion Lassie ..	Jr. 3 yrs.	2335	3.11.26	240	4	5,415	3·35	181·37	250	
				Rockbank Pet 2nd	Mature	1371	3.11.26	273	4	8,689	3·78	332·68	350	336
				Gladfield D.P. Princess ..	Jr. 3 yrs.	App. 4.	8.11.26	273	8	6,308	3·70	233·13	250	315
				St. Alban's Pearl	Mature	542	18.11.26	273	14	9,396	3·27	306·85	350	348, 378, 367
				May Queen 2nds Grand Daughter	Sr. 4 yrs.	1674	21.11.26	273	15½	7,507	4·05	303·72	325	273

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. Anderson, jnr., Lyndhurst	8	7	Jersey ..	Dolly 4th of King's Vale ..	Jr. 3 yrs.	16583	2.10.26	273	7½	5,926	5·20	307·93	250	312
				Ruby Rose of Tarnpirr ..	Mature	12861	5.10.26	273	21	7,542	5·27	397·27	350	436, 418, 491
				Rosella 12th of King's Vale ..	Jr. 2 yrs.	18604	11.10.26	273	11½	4,278	5·88	251·41	200	
				Brunette 19th of King's Vale	Jr. 2 yrs.	18596	15.10.26	273	12	4,479	5·22	234·00	200	
				Linda 64th of King's Vale ..	Sr. 3 yrs.	16588	22.10.26	273	4	5,451	5·74	312·73	275	372
				Viola 7th of King's Vale ..	Jr. 4 yrs.	14123	11.11.26	273	12½	4,628	5·92	273·94	300	311, 344
				Rosella 11th of King's Vale ..	Jr. 3 yrs.	16591	15.12.26	273	17	5,909	5·39	318·41	250	336
				Linda 68th of King's Vale ..	Jr. 2 yrs.	18602	21.12.26	273	15½	4,533	5·81	263·17	200	
W. H. Atherton, Murraydale	3	2	Jersey ..	Golden Wattle of Beverley ..	Jr. 3 yrs.	16596	27.9.26	240	4	5,220	5·81	303·53	250	258
				Mythic of Beverley ..	Jr. 2 yrs.	18608	7.10.26	273	13½	6,176	5·34	329·62	200	
				Rarity of Meadowvale ..	Mature	10134	17.10.26	273	19	4,824	5·87	283·05	350	331, 397, 354, 399
W. K. Atkinson, Swan Hill	20	15	Milking Shorthorn	Queenie 10th of Willow Park	Jr. 2 yrs.	..	29.9.26	273	14½	6,051	4·28	258·83	200	
				Damsel of Willow Park ..	Mature	13408	7.10.26	273	4	8,622	4·40	379·71	350	338, 409, 452
				Princess 5th of Willow Park ..	Jr. 2 yrs.	..	7.10.26	273	14	6,633	4·42	293·33	200	
				Countess 2nd of Willow Park	Jr. 3 yrs.	..	10.10.26	273	12	5,241	4·90	256·89	250	
				Queenie 9th of Willow Park ..	Jr. 2 yrs.	..	15.10.26	273	13½	5,079	4·33	219·73	200	
				Queenie of Willow Park ..	Mature	10451	20.10.26	240	4	6,510	3·68	239·59	350	270, 353, 313, 331, 338
				Duchess 3rd of Willow Park ..	Jr. 4 yrs.	13489	2.11.26	273	4	4,773	3·77	179·73	300	277
				Blanche of Willow Park ..	Mature	9080	15.11.26	273	..	9,888	3·98	393·43	350	322, 386, 362, 486
				Camelia of Willow Park ..	Jr. 3 yrs.	13206	16.11.26	273	26	10,362	4·26	440·97	250	384
				Butterfly of Willow Park ..	Jr. 3 yrs.	13201	20.11.26	273	13½	6,419	4·68	300·69	250	
				Queenie 6th of Willow Park ..	Jr. 3 yrs.	..	28.11.26	273	19	6,810	4·12	280·27	250	
				Comet of Willow Park ..	Jr. 4 yrs.	13307	30.11.26	273	4	7,178	4·29	308·07	300	214, 263
				Countess of Willow Park ..	Mature	9250	30.11.26	273	10½	8,936	4·54	405·93	350	264, 330, 382, 359, 342, 383
				Princess of Willow Park ..	Mature	12510	6.12.26	273	26½	10,917	3·76	410·01	350	256, 368, 370, 346, 407
				Dainty of Willow Park ..	Mature	13363	8.12.26	273	11½	6,678	4·44	296·41	350	240, 283, 285
				Moss Rose of Willow Park ..	Sr. 3 yrs.	14221	12.12.26	273	26	10,227	4·15	424·32	275	404
				Carnation of Willow Park ..	Sr. 2 yrs.	13226	17.12.26	273	15	5,849	4·55	266·15	225	259
				Peggy of Willow Park ..	Jr. 3 yrs.	14336	17.12.26	273	4	5,433	4·49	244·14	250	276
				Cherry of Willow Park ..	Mature	9198	25.12.26	273	41	16,245	3·88	629·94	350	325, 474, 636, 597, 623, 686
				Princess 4th of Willow Park ..	Jr. 3 yrs.	14450	26.12.26	273	9½	5,495	3·47	190·90	250	288

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
F. Austin, Lara	6	6	Jersey ..	Mercedes Buttercup 3rd of Avalon	Sr. 3 yrs.	15431	5.10.26	273	..	5,891	5·09	299·79	275	253, 261
				Daisy of Avalon	Jr. 2 yrs.	18617	6.10.26	273	14½	4,728	6·34	299·93	200	
				Mercedes Buttercup 5th of Avalon	Jr. 2 yrs.	18614	19.10.26	273	16	4,805	4·94	237·25	200	
				Noble's Buttercup of Avalon	Jr. 3 yrs.	16602	25.10.26	273	15½	6,207	5·79	359·43	250	251
				Pansy of Timberton ..	Mature	10138	1.11.26	273	15½	6,738	5·54	373·18	350	444, 407, 376
				Mercedes Buttercup of Avalon	Mature	12864	4.11.26	273	8	8,726	4·28	373·80	350	279, 272, 307
Aveley Stud Farm Pty. Ltd., Whittlesea	8	5	Jersey ..	Lady Starbright of Brucevale	Mature	12882	1.10.26	273	12½	7,361	5·17	380·63	350	267, 335, 353, 390
				Josephine of Aveley ..	Jr. 3 yrs.	18495	4.10.26	273	9	4,991	5·19	258·83	250	217
				Attraction of Tuerong ..	Mature	10478	15.10.26	273	11½	6,984	5·92	413.11	350	287, 408
				Hibiscus of Springhurst ..	Mature	9656	16.10.26	273	9	9,588	4·68	448·72	350	284, 416, 489, 497
				Marie Antoinette of Aveley ..	Jr. 3 yrs.	18496	22.10.26	240	4	4,260	4·95	210·95	250	264
				Lady Lene of Elouera ..	Mature	9702	1.11.26	273	7½	6,457	4·74	305·90	350	301, 326, 349
				Tragedy 3rd of Linden ..	Mature	10611	8.11.26	240	4	5,595	4·73	264·76	350	195
				Trinket of Aveley	Sr. 3 yrs.	9512	25.12.26	240*	10	5,130	5·43	278·40	275	249
W. H. Axford, Camperdown	3	3	Jersey ..	Patricia of Warenda ..	Mature	11225	28.9.26	273	17½	8,168	5·90	481·79	350	486, 537, 499, 497
				Handsome Girl 9th of Melrose	Mature	9882	4.10.26	273	9	6,501	6·27	407·56	350	326, 324, 343
				May 2nd of Melksham Park..	Mature	9834	8.10.26	273	4	7,365	4·81	354·20	350	313, 294
J. J. Baker, Bannockburn	2	2	Jersey ..	Lady Grey 25th of St. Albans	Sr. 4 yrs.	13326	29.9.26	240*	17½	7,035	5·19	365·11	325	263, 365, 432
				Goldfield Trixie	Jr. 3 yrs.	15449	7.11.26	210*	22	6,555	5·40	353·68	250	394
A. Balsillie, McIvor-road, Bendigo	1	..	Jersey ..	Preston May Blossom ..	Jr. 4 yrs.	15661	2.10.26	273	10½	5,501	5·13	282·29	300	
Mrs. I. Beard, Outtrim	2	1	Jersey ..	Merry Girl of Linga Longa ..	Sr. 2 yrs.	C.R.	12.10.26	273	7½	4,269	6·20	264·76	225	214
				Speck of Linga Longa ..	Jr. 2 yrs.	21113	1.11.26	273	6	3,167	6 19	195 88	200	

* Herd withdrawn before completion of test.

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
F. Bidgood, Staghorn Flat	1	1	Jersey ..	Staghorn Lotus	Jr. 2 yrs.	21125	1.10.26	273	10½	4,578	4·97	227·70	200	
A. A. Broad, Sutton Grange	9	9	Jersey ..	Rosa of Grangelea	Sr. 2 yrs.	18650	27.9.26	273	17	6,651	5·29	351·59	225	
				Goldfinch 2nd of Grangelea ..	Mature	14129	1.10.26	273	17½	7,947	5·51	437·77	350	266, 396
				Rosebud 2nd of Grangelea ..	Mature	14132	16.10.26	273	14	7,669	5·31	407·52	350	308, 319, 398
				Daisy 2nd of Grangelea ..	Mature	14128	22.10.26	273	17	7,442	6·15	457·80	350	294, 393, 390
				Defenders Favourite of Boorene	Mature	9225	26.10.26	273	18	9,672	5·24	506·49	350	418, 381, 409, 450, 552
				Princess 4th of Grangelea ..	Jr. 4 yrs.	15455	10.11.26	273	17½	8,396	5·40	453·68	300	312, 429
				Mignonette of Grangelea ..	Sr. 2 yrs.	11151	2.12.26	273	18	6,323	5·92	374·47	225	
				Rosebud 3rd of Grangelea ..	Sr. 2 yrs.	18651	22.12.26	273	21½	6,663	4·93	328·52	225	
				Princess 3rd of Grangelea ..	Mature	14130	27.12.26	273	23	8,019	5·09	408·07	350	295, 378, 458
Burnbank Cheese Company, Dhurringile	2	..	Friesian	Ashlynn 44th	Mature	1011	24.10.26	210	4	6,375	3·15	201·02	350	278
				Burnbank Inka Sylvia Amethyst	Jr. 4 yrs.	1812	27.10.26	210	4	5,805	3·63	210·64	300	274
J. E. Chadderton, Hamilton	1	1	Jersey ..	Thora 2nd of Jersey Meadows	Jr. 3 yrs.	17493	26.12.26	273	..	4,965	5·55	275·47	250	
J. Charlton, Stony Creek	1	1	Jersey ..	Daphne of Lumeah ..	Jr. 4 yrs.	..	1.10.26	210	4	5,692	5·71	325·00	300	
Cap. P. Chirnside, Oakleigh	1	1	Jersey ..	Werribee Attraction's Fancy Madeira	Mature	13337	18.12.26	273	22½	6,782	5·82	394·48	350	329, 384, 481
J. Clyne, Upper Maffra West	1	1	Jersey ..	Cora 2nd of Elouera ..	Jr. 4 yrs.	13394	9.11.26	273	20	7,500	5·67	424·93	300	285, 416

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Cockbill Bros., Rockbank	2	1	Ayrshire	Fulham Valetta	Jr. 4 yrs.	10919	9.11.26	273	5	7,280	4·73	344·01	300	
				Good Luck of Glenord ..	Mature	6253	12.11.26	273	8	7,704	4·42	340·54	350	368, 338
D. E. Cook, Loch	7	2	Jersey ..	Olive Branch of Banyule ..	Mature	7126	30.9.26	273	7½	4,916	5·23	257·00	350	
				Grey Girl of Wattle Vale ..	Mature	9267	3.10.26	273	8½	6,403	5·90	377·80	350	
				Cinderella 3rd of Wattle Vale	Mature	21200	13.10.26	273	11½	6,536	4·76	307·81	350	
				Daphne of Wattle Vale ..	Jr. 4 yrs.	16236	15.10.26	273	4	4,817	4·41	212·41	300	239
				Fairy Queen of Blackwood Valley	Jr. 3 yrs.	17418	18.10.26	273	6	4,550	6·86	311·95	250	251
				Modesty of Wattle Vale ..	Jr. 2 yrs.	21203	18.10.26	273	4	3,399	5·35	181·71	200	
				Millie of Kelburn	Mature	9270	3.11.26	273	4	7,306	4·36	318·53	350	278
E. Day, Pensthurst	1	1	Jersey ..	Midnight of Clover Flat ..	Mature	7445	29.11.26	273	26	9,150	5·12	468·16	350	446, 492
Department of Agriculture, Burnley	2	1	Friesian	Victoria Pattibelle	Sr. 2 yrs.	1707	27.9.26	273	18	7,680	3·57	273·90	225	
	..	..	Jersey ..	Victoria Beauteous ..	Mature	10198	16.10.26	273	7	4,653	6·90	320·90	350	272, 412, 367
Department of Agriculture, Werribee	8	7	Red Polls	Victoria Rose Major ..	Mature	5AA	30.9.26	273	13	9,573	3·83	366·20	350	216, 325, 330
				Victoria Bellbird	Sr. 4 yrs.	714A	7.10.26	273	11	6,567	5·14	337·84	325	337
				Victoria Calumet	Jr. 4 yrs.	790B	20.10.26	273	17	7,280	4·74	344·74	300	311
				Nictitana	Mature	311B	22.10.26	273	19	8,625	4·68	403·30	350	181, 385, 379, 381, 453, 470, 453, 526
				Victoria Beltamo	Sr. 2 yrs.	1148	30.10.26	273	18	7,888	4·27	336·49	225	
				Victoria Velvet Crown ..	Sr. 3 yrs.	967AA	3.11.26	273	11	6,128	4·98	305·04	275	308
				Victoria Bright Eye ..	Sr. 4 yrs.	788A	30.11.26	273	18	7,856	5·68	446·20	325	351
				Cutty Sark	Mature	383C	11.12.26	240	15½	7,365	4·50	331·60	350	373, 424, 373, 376, 440

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Department of Agriculture, Werribee—*continued.*	5	3	Friesian	Victoria Lean Patch ..	Sr. 3 yrs.	1705	1.10.26	273	4	8,172	3·74	306·01	275	326
				Victoria Songbelle ..	Jr. 3 yrs.	1708	18.10.26	273	18½	9,306	3·65	339·38	250	
				Victoria War Patch ..	Sr. 3 yrs.	1709	8.11.26	273	4	6,327	4·23	267·36	275	
				Victoria Milk Belle ..	Mature	997	23.11.26	273	26½	9,566	3·33	318·95	350	187, 231
				Victoria Patchwork ..	Jr. 3 yrs.	1706	1.12.26	273	17	7,304	3·74	273·45	250	304
H. Dettman, Kyneton	1	..	Jersey ..	Lycoris of Ellimatta ..	Jr. 2 yrs.	21255	4.12.26	180	4	1,848	4·65	86·04	200	
Dookie Agricultural College, Dookie	2	2	Ayrshire	Adella of Inverleigh ..	Mature	7706	25.10.26	273	9	8,814	4·09	360·41	350	267, 344, 381, 236
				Panook of Dookie	Sr. 2 yrs.	14715	17.11.26	273	4	4,682	5·02	235·17	225	
A. J. Eldridge, Noorat	1	1	Friesian	St. Albans Cordyline Inka ..	Sr. 2 yrs.	2289	25.12.26	273	21	8,400	3·75	315·80	225	
A. E. Ellis, Archies Creek	1	1	Jersey ..	Startle of Woorayl	Sr. 3 yrs.	14938	20.12.26	273	17½	6,608	5·55	366·98	275	290
G. Esler, Tongala	5	5	Jersey ..	Floss of Tuerong	Mature	10480	29.9.26	273	8½	7,967	5·59	445·29	350	256, 290, 298, 358, 437
				Daisy 3rd of Ballara ..	Jr. 3 yrs.	17502	1.10.26	273	15½	7,839	5·31	415·99	250	399
				Jubilee Thyme	Sr. 4 yrs.	14149	10.10.26	273	17	8,694	5·86	509·21	325	356, 366
				Patricia of Whitley ..	Jr. 3 yrs.	17732	23.11.26	273	4	6,468	5·98	386·53	250	368
				Jubilee Lily	Mature	10454	21.12.26	273	9½	6,532	5·49	358·40	350	332, 326, 348
A. T. N. Facey, Thomastown	3	3	Ayrshire	Sunshade of Glengowrie ..	Jr. 4 yrs.	11038	8.10.26	273	4	7,080	4·54	321·31	300	
				Olivedale Joybelle	Jr. 2 yrs.	15384	19.10.26	273	17½	6,566	4·17	274·06	200	
				Olivedale Shirley	Jr. 2 yrs.	15388	22.10.26	273	12	6,116	3·55	217·38	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
T. R. Findlay, Leitchville	4	3	Jersey ..	Twylish's Perree of Leven Brae	Jr. 2 yrs.	21276	27.9.26	273	12	4,503	5·09	229·18	200	
				Lady Grey of Colac ..	Jr. 2 yrs.	21275	27.9.26	273	12¾	4,176	5·66	236·23	200	
				Twylish's Princess of Leven Brae	Jr. 2 yrs.	C.R.	4.10.26	273	11	4,772	4·48	213·76	200	
				Lady Grey 22nd of St. Albans	Mature	13345	1.11.26	273	5	5,729	5.04	288.75	350	226, 350
Flack and Gamble, Berwick	2	2	Friesian	Burnbank Wooderest Patch .	Sr. 3 yrs.	1824	1.12.26	273	31½	10,820	3·73	403·53	275	344
				Ashlyn 71	Mature	1013	13.12.26	273	22½	15,333	3·93	603 28	350	421, 513
J. M. Foster, Somerville	1	1	Friesian	Burnbank Victress Alcartra	Jr. 3 yrs.	2146	30.11.26	273	14	10,469	3·81	398·72	250	
M. and W. A. Francis, Kilcunda	1	..	Ayrshire	Rosebud of Hillcrest ..	Mature	9080	13.10.26	273	11	6,140	4 07	250 12	350	163, 194, 250
G. Gange, Werribee	5	4	Ayrshire	Rosebud of Roseleigh ..	Sr. 4 yrs.	12109	19.10.26	273	13½	9,528	4·27	406·71	325	303, 430
				Melba of Roseleigh ..	Jr. 3 yrs.	13480	25.10.26	273	11	8,103	4·12	334·14	250	314
				Sunlight of Roseleigh ..	Mature	12110	3.11.26	273	12	7,611	3·70	281·37	350	232, 232
				Roseleigh Rosary	Jr. 2 yrs.	14803	7.12.26	273	..	5,063	4·26	215·85	200	
			..	Roseleigh Bloom	Sr. 2 yrs.	14802	12.12.26	273	19½	7,938	4·34	344·81	225	
J. L. Gardener, Welshpool	1	1	Jersey ..	Daisy Belle of Whare Koa ..	Jr. 4 yrs.	14152	30.11.26	273	5½	5,991	5·02	300 47	300	258, 310
Geelong Harbour Trust, Marshall	18	12	Ayrshire	Mab of Sparrovale	Jr 2 yrs.	16673	29.9.26	273	14	5,234	4·93	258·06	200	
				Mayflower of Sparrovale ..	Mature	6358	29.9.26	273	17	7,850	4·36	342·64	350	258, 380, 349, 345, 298
				Maisie of Sparrovale ..	Mature	13901	30.9.26	240	4	6,458	4·11	265·59	350	248, 342, 351, 287, 275
				Echo of Sparrovale ..	Jr. 3 yrs.	16655	1.10.26	273	17	6,240	4·23	263·90	250	200
				Gladys of Sparrovale ..	Mature	6355	1.10.26	273	14	7,016	4·37	306·94	350	278, 228, 273, 292, 305

STANDARD HERD TEST—*continued.*

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									lb.	lb.		lb.	lb.	
Geelong Harbour Trust, Marshall—*continued.*	18	12	Ayrshire	Robena of Sparrovale ..	Jr. 3 yrs.	16701	3.10.26	273	4	6,386	4·86	310·39	250	215
				Bangle of Sparrovale ..	Jr. 2 yrs.	16638	9.10.26	273	12	5,003	4·20	209·90	200	
				Rosalind of Sparrovale ..	Mature	9108	9.10.26	273	4	6,321	4·72	298·31	350	171, 236. 262
				Scottish Flower of Sparrovale	Jr. 2 yrs.	16709	11.10.26	273	12	4,958	4·79	237·45	200	
				Scottish Daisy of Sparrovale..	Jr. 2 yrs.	16708	12.10.26	273	13	4,944	5·03	248·56	200	
				Phoebe of Sparrovale ..	Jr. 2 yrs.	16696	15.10.26	273	13	4,433	4·56	202·32	200	
				Matron of Sparrovale ..	Jr. 3 yrs.	16678	1.11.26	273	11½	6,162	4·38	269·86	250	234
				Beryl of Sparrovale ..	Mature	9039	4.11.26	273	..	8,741	4·57	399·90	350	215, 248, 368
				Narcissa of Sparrovale ..	Jr. 2 yrs.	16690	8.11.26	273	¼	5,758	4·49	258·66	200	
				Baronia of Sparrovale ..	Mature	7309	14.11.26	273	8	9,638	3·92	377·61	350	400, 403, 485, 357
				Belladonna of Sparrovale .	Mature	9092	18.11.26	273	..	8,483	4·31	365·40	350	242. 302
				Myrtle of Sparrovale ..	Mature	3905	28.11.26	273	9	6,842	4·56	311·84	350	236, 271, 278, 238, 303, 209
				Balm of Sparrovale.. ..	Jr. 2 yrs.	16637	29.11.26	273	15	3,830	5·05	193·23	200	
O. Gepp, Macleod	1	1	Jersey ..	Maid 3rd of Linden ..	Mature	10608	23.10.26	273	16	6,555	6·29	412·18	350	265, 358, 404, 513
Gibson Bros., Trafalgar	4	2	Jersey ..	Lorraine of Leathorne ..	Jr. 3 yrs.	16275	4.10.26	273	9½	4,428	5·53	245 08	250	
				Lynette of Leathorne ..	Jr. 3 yrs.	16276	8.10.26	273	4	3,419	6·02	205 73	250	292
				Sweet Star of Glen Iris ..	Jr. 3 yrs.	14178	8.10.26	273	12⅝	5,489	6·13	336·64	250	283
				Old Gold of Glen Iris ..	Sr. 2 yrs.	16681	24.10.26	273	11½	4,593	6·68	306·96	225	
R. Goodman, Kilmany	4	..	Ayrshire	Floss of Roseneath ..	Mature	7333	14.10.26	240	4	5,805	4·16	241 35	350	232, 314, 169
				Nightingale 2nd of Raith ..	Mature	9760	10.11.26	273	14½	6,531	3·77	246 31	350	231, 275, 258, 153, 427, 358
				Starlight of Roseneath ..	Jr. 4 yrs.	13516	12.11.26	210	4	4,275	4·24	181·05	300	249, 218
				Roseneath Goldleaf.. ..	Jr. 2 yrs.	14838	28.11.26	210	4	3,150	3·80	119·78	200	
A. W. Gorman, Alexandra	3	2	Ayrshire	Maisie of Cathcart	Jr. 4 yrs.	11079	2.10.26	273	7	6,627	4 07	269 93	300	254, 283
				Muriel of Cathcart	Jr. 2 yrs.	13522	26.10.26	273	7	4,044	5.10	206·18	200	
				Favourite of Cathcart ..	Jr. 3 yrs.	12141	15.11.26	273	4½	5,928	4·55	269·84	250	254

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
E. Hall, Tongala East	1	..	Jersey ..	Queenie of Comely Banks ..	Mature	15497	3.11.26	273	11½	6,641	5·19	344·94	350	254, 301
J. E. Handbury and Son, Toora	3	1	Jersey ..	Lassie of Tooravale ..	Jr. 2 yrs.	18727	6.10.26	273	12½	4,526	5·82	263·43	200	
				Lassie 5th of Clover Flat ..	Mature	9742	11.10.26	273	4	6,192	4·96	307·21	350	322, 316, 347, 293
				Daisy 12th of Melrose ..	Mature	9876	15.12.26	273	10½	4,914	5·80	285 08	350	305, 334
D. Harker, Caldermeade	4	1	Ayrshire	Stella of Thirlmere	Jr. 3 yrs.	12212	8.11.26	273	7½	5,836	4·57	266·84	250	
				Alva of Thirlmere	Jr. 3 yrs.	12209	15.11.26	273	7	4,801	4·27	205·16	250	
				Petals of Rankeillor ..	Mature	9218	20.11.26	273	9½	7,103	4·64	329 29	350	
				Poppy of Thirlmere ..	Jr. 4 yrs.	12211	15.12.26	240	4	5,170	4·32	223·23	300	
T. Harvey, Boisdale	2	2	Jersey ..	Sparkle 7th of Jerseyholm ..	Jr. 4 yrs.	13359	4.11.26	273	12	6,051	6·92	418 89	300	351, 410
				Kirsty 16th of Jerseyholm ..	Jr. 2 yrs.	18736	10.11.26	273	13½	6,191	5·66	350 68	200	
W. Henderson, Grasmere (Share Farm)	2	..	Ayrshire	Pearl 3rd of Carracoorte ..	Mature	9424	6.10.26	210	4	4,650	4·26	197 97	350	143, 185, 148, 270, 211, 238
				Mayflower 2nd of Carracoorte	Mature	9409	9.10.26	240	4	5,850	4·25	248·74	350	235, 240, 271, 249
W. Henderson, Grasmere (Home Farm)	3	1	Ayrshire	Bunty 3rd of Carracoorte ..	Mature	9330	3.10.26	240	4	6,540	4·77	312 04	350	208, 341, 389, 195
				Viola 4th of Carracoorte ..	Mature	9454	6.11.26	273	21½	9,936	4·40	437 07	350	239, 346
				Prue 4th of Carracoorte ..	Mature	9431	10.11.26	273	21	7,151	4·80	343·19	350	206, 317, 285
R. J. Henry, Euroa	1	1	Jersey ..	Dolichos of Cooel	Jr. 2 yrs.	18747	21.10.26	273	10	4,848	5·61	271·98	200	
E. H. Howlett, Morwell	6	5	Jersey ..	Lily 2nd of Latrobe ..	Jr. 2 yrs.	18752	30.9.26	273	4	6,374	5·56	354·31	200	
				Venus of Banyule	Sr. 3 yrs.	11617	6.10.26	273	14	6,960	5·40	375·96	275	335, 363
				Starfinch 7th of Banyule ..	Jr. 4 yrs.	11609	18.10.26	273	10	6,872	6·02	414 03	300	324, 329
				Silvermine 2nd of Latrobe ..	Jr. 2 yrs.	18753	8.11.26	273	..	4,563	5·41	246·67	200	
				Lotus 2nd of Banyule ..	Mature	11588	23.11.26	273	9½	4,944	5·64	278·67	350	245
				Andante of Banyule ..	Jr. 2 yrs.	16686	27.11.26	273	8½	4,616	5·46	251·94	200	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. A. Huffer, Gormandale	2	2	Jersey ..	Rosebud 2nd of Brookfield ..	Mature	9617	27.9.26	273	11½	8,547	4·88	417·25	350	348, 379, 446
				Rosebud 2nd of Paradise ..	Sr. 3 yrs.	13798	17.10.26	273	20	7,035	5·94	418·18	275	399, 401
W. H. Hurrey, Koonwarra	2	2	Jersey ..	Carrie 3rd of Queen's Vale ..	Jr. 3 yrs.	16285	1.10.26	273	19½	7,832	6·93	542·78	250	343, 459
				Cream Belle 6th of Gnarbrook	Sr. 2 yrs.	17443	11.12.26	273	18	5,950	5.24	311·96	225	280
A. Joshua, Berwick	1	..	Jersey ..	Goldfinch of Cloverfield ..	Jr. 3 yrs.	16293	14.11.26	273	4	3,299	6·17	203·70	250	212
G. A. Kent, Archie's Creek	4	2	Ayrshire	Mermaid 3rd of Woolamai Park	Jr. 2 yrs.	13748	17.10.26	273	14	4,767	4·83	230 27	200	
				Peggy of Woolamai Park ..	Mature	5275	17.10.26	273	7½	6,938	4·43	307·01	350	224, 244, 267, 325, 307, 326
				Dulcie of Woolamai Park ..	Jr. 3 yrs.	12355	28.11.26	273	9	6,332	4·06	257·08	250	248
				Peeress of Woolamai Park ..	Jr. 4 yrs.	11156	20.12.26	273	7	6.218	4·52	281·11	300	237, 271
H. W. King, Gormandale	2	2	Jersey ..	Twilight of Glen Valley ..	Jr. 2 yrs.	21390	16.10.26	273	10	5,496	4·81	264·23	200	
				Honey Bee of Rosehill ..	Sr. 3 yrs.	14847	17.10.26	273	8½	6,635	5·69	377·52	275	
T. Knowles, Dandenong	4	3	Ayrshire	Palm of Gleneira	Mature	7098	19.10.26	273	10½	5,952	4·34	258·28	350	
				Plum of Invergordon ..	Jr. 2 yrs.	13235	6.11.26	273	9	5,603	4·67	261·39	200	
				Fanny of Rosstrevor ..	Jr. 2 yrs.	13349	13.11.26	273	10½	6,732	3·91	262·94	200	
				Heather of Invergordon ..	Jr. 2 yrs.	13234	2.12.26	273	..	4,584	4·68	214·50	200	
Mrs. E. M. Lennie, Tongala	3	3	Jersey ..	Linda 4th of the Valley ..	Jr. 3 yrs.	17776	16.10.26	273	12	6,840	4·57	312·92	250	277
				Music of the Valley.. ..	Jr. 3 yrs.	17450	7.11.26	273	4	6,429	5·40	346·99	250	259
				Poppy 2nd of Hill Crest ..	Mature	17778	15.11.26	273	14½	6,101	6·46	413·67	350	424
Leongatha High School, Leongatha	3	2	Jersey ..	Queen of Woorayl	Jr. 2 yrs.	17674	8.10.26	273	13½	4,881	6·75	329·63	200	
				Last Choice of Woorayl ..	Jr. 2 yrs.	17672	18.10.26	180	4	2,100	6·91	145·15	200	
				Moanna of Woorayl ..	Jr. 2 yrs.	17673	16.12.26	273	10½	3,986	5·96	237·60	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
H. N. Littledike, Werribee	3	3	Jersey ..	Clara's Chief of Boorne ..	Jr. 3 yrs.	19871	29.9.26	273	..	7,719	5·39	416·16	250	
				Marguerite of Paradise ..	Sr. 2 yrs.	17452	9.10.26	273	17	7,487	5·22	390·80	225	304
				Linnacre's V.C. of Boorne ..	Jr. 2yrs.	C.R.	1.11.26	273	11	5,211	5·09	265·34	200	
J. G. Lobb, Tooradin	2	..	Ayrshire	Cloverleaf of Springfield ..	Sr. 4 yrs.	8869	11.10.26	180	4	4,095	4·27	174 87	325	221, 212
				Bona Vista Marcia 2nd ..	Jr. 2 yrs.	15043	14.10.26	273	4	4.056	4·01	162 66	200	
Longerenong Agricultural College, Dooen	11	3	Ayrshire	Madge of Longerenong ..	Jr. 3 yrs.	12433	1.10.26	273	6½	5,618	4·17	234 42	250	243
				Merle of Longerenong ..	Jr. 3 yrs.	12435	1.10.26	273	8	6,714	4·68	314·17	250	283
				Lantana of Longerenong ..	Sr. 2 yrs.	13821	7.10.26	210	4	4,395	4·17	183·42	225	185
				Longerenong Melody ..	Jr. 2 yrs.	15049	20.10.26	273	6	4,214	5·07	213·57	200	
				Dolichos of Longerenong ..	Mature	9789	22.10.26	240	4	7,035	4.08	287.08	350	244, 324, 258
				Longerenong Tecoma ..	Jr. 2 yrs.	15053	23.10.26	273	11	4,079	5 65	230 42	200	
				Star of Longerenong ..	Jr. 3 yrs.	13825	1.11.26	180	4	2,760	4·45	122·70	250	187
				Mercy of Oakbank	Mature	5350	11.11.26	240	4	5,985	4·33	259·07	350	297, 303, 327
				Sunshade of Ellerslie ..	Mature	7582	16.11.26	240	4	4,335	3·95	171·36	350	
				Starette of Fern Hill ..	Mature	5949	25.11.26	273	6½	6,491	4 09	265·16	350	256, 281, 348
				Primrose of Longerenong ..	Jr. 4 yrs.	12437	9.12.26	273	7	5,096	4·24	216·10	300	266, 201
Mrs. L. Lowing, Tongala	6	6	Jersey ..	Nellie of Jersey Vale ..	Jr. 2 yrs.	21543	7.10.26	273	10	4.542	4·97	225·81	200	
				Patricia of Jersey Vale ..	Jr. 2 yrs.	18886	9.10.26	273	7½	3,844	5·63	216 79	200	
				Fern of Jersey Vale ..	Jr. 2 yrs.	19926	11.10.26	273	14	6,164	5·21	321·44	200	
				Sweet Lily of the Valley ..	Jr. 2 yrs.	21426	11.11.26	273	10	5,024	4·55	228·38	200	
				Aster of Jersey Vale ..	Jr. 2 yrs.	18882	17.11.26	240	4	4,628	5·18	239·94	200	
				Phyllis of the Valley ..	Sr. 2 yrs.	21425	20.11.26	273	15	6,113	4.14	253.32	225	
C. G. Lyon, Heidelberg	6	5	Jersey ..	Audrey Lotus of Banyule ..	Mature	9478	30.9.26	273	21½	8,829	4·41	389 53	350	274, 358, 445
				Velveteen 9th of Banyule ..	Jr. 2 yrs.	16696	16.10.26	273	23½	6.651	4 73	314 28	200	
				Princess 2nd of Banyule ..	Jr. 3 yrs.	14194	27.10.26	273	23	7,032	5·84	410·53	250	406
				Silvermine 24 of Banyule ..	Mature	11601	2.11.26	273	17	7,133	4·76	339·87	350	299, 406, 426
				Silvermine 27 of Banyule ..	Jr. 4 yrs.	11603	15.12.26	273	18	6,657	5·73	381·22	300	216, 378
				Molly 18th of Banyule ..	Jr. 3 yrs.	14193	20.12.26	273	20	7,514	5·21	391·64	250	351

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
M. Lyons, Bamawm	1	1	Jersey ..	Kyora Starbright	Jr. 4 yrs.	16308	2.12.26	273	..	7,373	5·03	371·08	300	164, 328
C. W. Macauley, Rochester	1	1	Jersey ..	Flower of Taranah	Jr. 3 yrs.	16717	14.11.26	273	12	5,679	5·30	300·99	250	425
J. McDougal, Byaduk	4	3	Jersey ..	May Queen 2nd of Park View	Jr. 3 yrs.	17790	27.9.26	273	10	5,391	5·42	292·25	250	280
				Florence of Kelburn ..	Mature	13374	1.10.26	273	10½	7,281	4·62	336·04	350	335
				Novelty of Park View ..	Jr. 3 yrs.	17791	14.10.26	273	18½	7,722	5·15	397·86	250	374
				Flora of Parkview	Jr. 2 yrs.	18826	23.10.26	273	17½	6,237	5·42	338·33	200	
H. V. MacLeod, Tyrendarra	6	5	Jersey ..	Velveteen 6th of Banyule ..	Mature	11615	3.10.26	273	5	5,698	4·99	284·49	350	
				Silvermine of Strathbow ..	Sr. 4 yrs.	13229	10 10 26	273	14½	7,650	6 09	466·23	325	
				Lady Monica 20th of King's Vale	Jr. 2 yrs.	18601	22.10.26	273	18½	6,053	5·52	334·36	200	
				Kyora Duke's Needle 2nd ..	Jr. 2 yrs.	18945	24.11.26	273	..	4,607	5·94	273·84	200	
				Princess of Castlemaddie ..	Jr. 2 yrs.	21484	24.11.26	273	18½	6,807	5·12	348·68	200	
				Cornflower 2nd of Castlemaddie	Jr. 2 yrs.	21478	26.12.26	273	13	4,061	6·60	268·01	200	
R. H. Maher, Tongala	1	1	Jersey ..	Peerless 20th of Melrose ..	Mature	9897	30.10.26	273	6	6,536	5·82	380·18	350	361, 336, 370, 373, 417
P. J. Maloney, Tongala	3	3	Jersey ..	Tiny Choice of Belgonia ..	Mature	11634	1.10.26	273	22	10,383	6·02	624·56	350	384, 340
				Science of Comely Banks ..	Jr. 4 yrs.	13350	15.10.26	273	14½	8,810	4·87	429·08	300	342, 325
				Milklass of Belgonia ..	Jr. 3 yrs.	21491	5.12.26	273	20	7,809	5·53	431·52	250	
A. J. Mapleson, Jindivick	8	8	Jersey ..	SeaShell of Hazeldale ..	Jr. 4 yrs.	13758	3.10.26	273	19½	7,947	6·03	479·57	300	
				Seaweed of Hazeldale ..	Jr. 2 yrs.	21502	11.10.26	273	15	5,852	5·05	295·63	200	
				Opal of Hazeldale	Jr. 2 yrs.	21500	14.10.26	273	12	5,036	5·14	259·06	200	
				Dinkum Rose of Hazeldale ..	Sr. 2 yrs.	17469	14.10.26	273	12	5,372	5·94	319·24	225	
				Eileen 2nd of Clarendon Eyre	Sr. 4 yrs.	13521	14.10.26	273	20	8,145	5·74	467·88	325	
				Jessie's Pride of Hazeldale ..	Jr. 2 yrs.	21496	16.10.26	273	12½	4,889	5·92	289·57	200	
				Jessie of Meridale	Mature	9552	16.10.26	273	18½	8,086	6·34	513·05	350	
				Moonlight of Hazeldale ..	Jr. 2 yrs.	21499	21.10.26	273	10	4,725	4·89	230·93	200	

Standard Herd Test—*continued.*

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									lb.	lb.		lb.	lb.	
T. Mesley, Dalyston	8	8	Jersey ..	Lady Gold of Murta ..	Jr. 2 yrs.	21513	7.10.26	273	14½	5,145	5·96	306·52	200	
				Lassie of Murta	Jr. 2 yrs.	21514	10.10.26	273	19½	5,795	4·67	270·78	200	
				Cello of Warenda	Sr. 4 yrs.	13376	26.10.26	273	22½	7,130	6·07	432·59	325	431
				Charmian III. of Warenda ..	Jr. 3 yrs.	17802	31.10.26	273	15	5,250	6·66	349·63	250	345
				Gazelle 3rd of Warenda ..	Sr. 3 yrs.	15558	2.11.26	273	17	7,175	5·33	382·33	275	367, 462
				Ragtime 2nd of Warenda ..	Jr. 4 yrs.	15560	9.11.26	273	9	6,311	6·36	401·18	300	448, 498
				Meadow Queen of Warenda ..	Jr. 3 yrs.	17805	28.11.26	273	17½	6,044	5·19	313·41	250	322
				Garenne 5th of Warenda ..	Jr. 4 yrs.	15557	28.11.26	273	17½	5,025	6·88	345·53	300	385, 437
T. M. Noble, Maffra	1	1	Jersey ..	Canary 5th of Lesterfield ..	Mature	12163	17.12.26	273	14½	7,364	5·88	433·29	350	322, 509
Mrs. L. Orchard, Graham Vale	15	5	Jersey ..	Lily 2nd of Jersey Vale ..	Mature	11658	27.9.26	273	6	5,075	6·00	304·49	350	146, 336, 269
				Daphne of Jersey Vale ..	Sr. 3 yrs.	15578	28.9.26	273	9	6,117	5·43	332·14	275	269
				Tulip of Jersey Vale ..	Mature	10360	4.10.26	210	4	4,305	4·83	208·07	350	260, 275, 301, 295, 200
				Lucy of Jersey Vale ..	Jr. 2 yrs.	21541	5.10.26	273	5	3,992	4·85	193·51	200	
				Poppy of Jersey Vale ..	Jr. 4 yrs.	15582	5.10.26	273	9	6,611	4·71	311·43	300	196, 234
				Iris of Jersey Vale ..	Sr. 3 yrs.	15580	5.10.26	273	9	5,922	5·11	302·87	275	245, 241
				Dot of Jersey Vale ..	Mature	9589	12.10.26	240	4	3,600	5·55	199·73	350	265, 289, 198
				Pearl of Jersey Vale ..	Jr. 4 yrs.	15581	13.10.26	273	8	5,619	5·07	285·09	300	202, 220
				Mabel of Jersey Vale ..	Sr. 2 yrs.	18885	16.10.26	273	12	4,719	4·93	232·50	225	179
				Daffodil of Jersey Vale ..	Mature	7220	25.10.26	273	8	4,367	5·01	218·76	350	229, 251, 251, 284, 241, 194
				Snowdrop of Jersey Vale ..	Mature	11659	25.10.26	273	12	5,607	5·38	301·76	350	164, 285, 302, 257
				Lily of Jersey Vale ..	Mature	10356	4.12.26	273	10	5,193	5·47	283·97	350	178, 137, 223, 279, 248, 228
				Cora of Jersey Vale ..	Jr. 4 yrs.	15577	5.12.26	150	4	4,002	5·08	203·15	300	254, 196
				Joyce of Jersey Vale ..	Sr. 2 yrs.	19937	7.12.26	273	11	4,130	5·60	231·46	225	177
				Hyacinth of Jersey Vale ..	Jr. 4 yrs.	15579	16.12.26	273	14	4,511	5·66	255·50	300	212, 228
W. Parbury, Warburton	3	3	Jersey ..	Rosalind 6th of Brookfield ..	Jr. 4 yrs.	21561	29.10.26	273	18½	5,726	5·52	315·82	300	310
				Rosalind 8th of Brookfield ..	Jr. 3 yrs.	21562	15.12.26	273	19	5,867	5·06	297·03	250	
				Beauty 6th of Brookfield ..	Jr. 3 yrs.	15583	17.12.26	273	21	7,088	3·76	266·79	250	

STANDARD HERD TEST—*continued.*

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									lb.	lb.		lb.	lb.	
J. Phillips, Murraydale	4	4	Jersey ..	Hopes Surprise of Peri ..	Sr. 2 yrs.	17819	1.10.26	273	..	6,143	4·52	277·84	225	259
				Faith of Peri ..	Sr. 4 yrs.	13011	25.10.26	273	20½	7,529	4·69	352·94	325	266, 282
				Vanilla 18th of Melrose ..	Mature	13424	11.11.26	273	9½	6,520	5·99	390·44	350	328, 401, 428
				Carnation of Peri	Sr. 2 yrs.	17818	17.11.26	273	4	5,564	5·03	279·68	225	221
J. Plattfuss, Tongala	10	10	Friesian	Yorkshire Dominion Gracie ..	Sr. 2 yrs.	1723	28.9.26	273	9	8,022	3·93	315 21	225	280
				Yorkshire Oakwood Cordyline	Jr. 2 yrs.	2077	7.10.26	240	4	5,070	4 09	207·61	200	
				Monovale Juno Paxton ..	Mature	169	10.10.26	273	45	16,939	3·51	595·24	350	326, 388, 545
				Castle Hill Empress ..	Jr. 2 yrs.	2154	12.10.26	273	10	8,414	3·56	299 24	200	
				Yorkshire Rosevale Ideal ..	Jr. 4 yrs.	1443	14.10.26	273	18½	17,513	3·61	631·54	300	498, 553
				Burnbank Lolkje Patch ..	Jr. 3 yrs.	1816	7.11.26	273	..	10,397	3·36	349·75	250	281
				Greenvale Juno Rose 2nd ..	Sr. 3 yrs.	1570	23.11.26	273	33½	14,906	3·65	544 00	275	349
				Greenvale Mona 2nd ..	Jr. 2 yrs.	App. 3	27.11.26	273	14½	6,644	3·56	236·83	200	
				Greenvale Ideal Paxton ..	Jr. 2 yrs.	2198	3.12.26	273	25	9,188	3·53	324·50	200	
				Burnbank Spring Patch ..	Jr. 3 yrs.	1819	5.12.26	273	4	7,022	3·59	251·99	250	312
Mrs. M. A. Poole, Caldermeade	1	..	Ayrshire	Foliage of Golden Vein ..	Mature	5423	23.10.26	273	5½	6,425	4·09	262·52	350	278, 251
Quigley and Bennett, Yinnar	1	1	Jersey ..	Bluebell of Ellendale ..	Jr. 2 yrs.	18922	25.11.26	273	13	5,663	5·43	307·75	200	
F. Raggatt, Euroa	2	1	Jersey ..	Lady Fowler of Rosemont ..	Jr. 3 yrs.	16720	26.10.26	273	5½	6,119	5 04	308·22	250	256, 237
				Lantana 2nd of Springhurst ..	Mature	10446	9.11.26	273	10	5,387	5 28	284·69	350	375, 411, 328, 316
Miss H. E. Raleigh, Pakenham Upper	2	2	Jersey ..	Stella Twylish of Goronga Farm	Jr. 2 yrs.	21596	12.11.26	273	14	5,432	5·10	277·19	200	
				Trumpet Daffodil of Goronga Farm	Jr. 2 yrs.	21597	15.11.26	273	11½	4,538	5·93	269·29	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. A. Regnier, Poowong	3	1	Friesian	Gala Rosevale Pauline ..	Jr. 2 yrs.	2177	30.10.26	273	..	5,645	3·47	195·77	200	
				Baromi Belle	Jr. 4 yrs.	App. 4, Vol, 5	14.11.26	273	..	6,435	4·88	314·13	300	
				St. Albans Helen	Mature	367	22.12.26	273	16	6,134	3·28	201·16	350	
J. D. Read, Springhurst	1	1	Jersey ..	Gladiolus of Springhurst ..	Mature	12216	4.12.26	273	24	9,785	5·59	547·41	350	341, 479, 542
W. S. Richardson, Riddell	1	..	Jersey ..	Golden Pareil 2nd of Boorene	Mature	11227	11.11.26	273	9	4,944	6.48	320.43	350	295, 376
Miss S. L. Robinson, East Kew	8	5	Jersey ..	Golden Jazz of Woodside ..	Sr. 2 yrs.	18513	29.9.26	273	16	5,340	5·08	271·52	225	289
				Kyora Foch's Anthem ..	Jr. 2 yrs.	21624	30.9.26	273	11½	4,280	5·47	234·01	200	
				Countess Matilda 4th imp. ..	Mature	13869	5.10.26	273	14	7,380	5·54	408·74	350	376
				Kyora Anthem	Mature	11686	6.10.26	273	4	5,352	5·66	303 08	350	183, 253, 314, 379
				Naldera of Woodside ..	Mature	14170	22.10.26	273	11	6,009	5 18	311·50	350	293, 340, 373
				Kyora Twinkle 2nd ..	Jr. 4 yrs.	15044	18.11.26	273	10½	5,274	5·48	288·76	300	326
				Kyora Fancy's Velveteen ..	Jr. 2 yrs.	21623	8.12.26	273	15½	5,000	5 50	274·75	200	
				Brown Star of Glen Iris ..	Sr. 2 yrs.	16672	9.12.26	273	12½	4,193	6·17	258·78	225	
G. Rowe, Kardella	7	5	Jersey ..	Sparklight's Pansy of Welbourne	Jr. 3 yrs.	21637	10.10.26	273	9	4,199	6 28	263·10	250	
				Jessie 42nd of Melrose ..	Jr. 3 yrs.	17830	12.10.26	273	13	6,035	5 64	340 15	250	346
				Handsome Pansy of Welbourne	Jr. 3 yrs.	17829	17.10.26	273	15	6,795	4·80	326·32	250	262
				Trixie of Welbourne ..	Jr. 2 yrs.	21638	20.10.26	273	9½	3,599	6 13	220·77	200	
				Sweet Pansy's Poppy of Welbourne	Mature	13387	20.11.26	273	15½	4,907	6·24	306·32	350	180, 268
				Pansy Leaf of Welbourne ..	Jr. 2 yrs.	21636	1.12.26	273	8½	3,229	6·28	202·81	200	
				Joy of Hill Crest	Mature	10468	7.12.26	273	4	4,704	5·36	252·35	350	205, 222, 207, 264, 246
C. N. Runciman, Murraydale	1	..	Jersey ..	Sapphire 2nd of Lea Hurst ..	Jr. 2 yrs.	21226	7.11.26	273	4	2,849	5·88	167·51	200	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. A. Sandles, Mt. Best, via Toora	5	3	Jersey	Lady Joan of Franklin Park..	Jr. 2 yrs.	18960	30.9.26	273	9	4,167	5·79	241·11	200	
				Dot of Franklin Park ..	Mature	10484	26.10.26	273	8	5,616	4·71	264·44	350	255, 273
				Rose of Franklin Park ..	Sr. 4 yrs.	13015	27.10.26	273	4	5,720	5·71	326·43	325	228, 264
				Queenie of Franklin Park ..	Sr. 2 yrs.	16750	14.12.26	273	..	5,228	4·86	253·96	225	256
				Rose's Princess of Franklin Park	Jr. 2 yrs.	18961	17.12.26	273	..	3,349	5·18	173·54	200	
Salesian College, Sunbury	8	..	Ayrshire	Isla of Ben Kell	Mature	6739	7.10.26	273	8½	6,915	4·20	290·61	350	300, 408, 311, 384,
				Millie 2nd of Retreat ..	Mature	7536	9.10.26	273	4	6,095	4·10	249·72	350	280, 324
				Myrtle of Retreat	Mature	7537	16.10.26	273	4	6,599	4·37	288·60	350	329, 326, 293
				Virtue of Ayrbrae	Mature	7565	2.11.26	210	4	4,005	4·50	180·23	350	188, 231, 225, 260 289
				Linda of Medburn Grove ..	Mature	8303	28.11.26	240	4	5,370	3·90	209·34	350	284, 355, 394, 406, 318
				Daisy of Rupertswood ..	Jr. 3 yrs.	12596	20.12.26	273	13	5,184	4·69	242·97	250	299
				Grace of Roseleigh	Mature	7301	22.12.26	210	4	4,455	3·86	172·09	350	297, 255, 231
				Alice of Rupertswood ..	Jr. 3 yrs.	12595	27.12.26	240	4	4,733	4·01	189·79	250	226
A. H. Schier, Kernot	13	..	Ayrshire	Scotswood Queen of Scots ..	Jr. 2 yrs.	15494	17.10.26	233	4	3,378	4·90	165·37	200	
				Boronia 2nd of Pine Grove ..	Mature	4626	19.10.26	180	4	3,840	4·25	163·07	350	269, 226, 281, 279, 239, 275, 238
				Scotswood Jeanette ..	Mature	10298	23.10.26	240	4	6,450	3·78	243·94	350	229, 264, 322
				Scotswood Mabs	Jr. 4 yrs.	11367	25.10.26	273	8	5,805	4·19	243·51	300	234
				Scotswood Reason	Mature	10316	26.10.26	240	4	4,185	3·78	158·37	350	189, 129, 248
				Scotswood Joan	Jr. 2 yrs.	15480	27.10.26	150*	8½	2,205	4·10	90·41	200	
				Scotswood Silverine ..	Jr. 2 yrs.	15497	5.11.26	240	4	3,300	4·07	134·30	200	
				Myrtle 2nd of Pine Grove ..	Mature	4637	14.11.26	273	8	6,354	4.01	254.93	350	282, 264, 298, 308, 335, 364, 275
				Scotswood Snowdrop ..	Jr. 2 yrs.	15498	18.11.26	210	4	2,310	4·43	102·24	200	
				Coilsfield Fay	Jr. 3 yrs.	14061	20.11.26	258	4	3,886	4.17	162.21	250	156
				Scotswood Myra	Sr. 4 yrs.	14158	28.11.26	273	7½	5,589	4·24	236·72	325	196, 263
				Fay of Banyule	Mature	6764	30.11.26	210	4	4,275	3·65	155·96	350	348, 344, 271
				Scotswood Streak	Jr. 2 yrs.	15500	10.12.26	273	7½	3,089	4·05	125·20	200	

*Withdrawn from Test.

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Simpson and Son, Lower Ferntree Gully	5	4	Jersey ..	Gaiety Girl 11th of Melrose ..	Mature	9442	29.9.26	273	9	5,204	5 85	304 63	350	249, 334, 337, 383
				Romany Rye of Aberdour ..	Jr. 2 yrs.	18974	31.10.26	273	12	4,746	4·98	236 18	200	
				Harmony of Hill Crest ..	Mature	13745	9.11.26	273	20	7,760	4 83	375·10	350	355
				Heather Bell of Aberdour ..	Jr. 2 yrs.	18972	28.11.26	273	13½	4,890	5 20	254 28	200	
				Wompini Daisy	Jr. 2 yrs.	Vol. 15	18.12.26	273	16½	4,940	5·15	254·31	200	
Smith and Sons, Woolend	1	1	Friesian	Halecote Oakleaf Folkes ..	Mature	600	28.11.26	273	38½	15,512	3 77	584 56	350	299, 466, 642, 693
O. J. Syme, Macedon	3	3	Friesian	Bainfield Topsy 13th ..	Mature	6212	5.10.26	273	39½	16,079	3 95	634 85	350	593, 624
				Bainfield Sylvia Topsy 2nd ..	Mature	1458	11.12.26	273	21½	9,602	3 87	371·30	350	479
				Bolobek Moss Rose ..	Jr. 2 yrs.	2104	27.12.26	273	20	7,544	3·60	271·34	200	
Telford Bros., Kyabram	2	2	Ayrshire	Topsy of Hyde Park* ..	Jr. 2 yrs.	14252	23.9.26	273	11	5,811	4 70	273 33	200	
				Daphne of Hyde Park ..	Jr. 4 yrs.	12861	28.10.26	273	5	7,263	4 78	346 97	300	356, 291
L. W. Thompson, Pakenham	1	1	Jersey ..	Gaiety Girl 2nd of Mendip ..	Jr. 2 yrs.	Vol. 14	5.11.26	273	20	6,000	6 06	363 70	200	
J. F. Tuckey, Alberton	6	1	Ayrshire	Tregorland Kiss	Jr. 2 yrs.	15000	1.10.26	210	4	3,555	4·52	160·60	200	
				Kitten of Tregorland ..	Jr. 4 yrs.	14270	5.10.26	210	4	4,980	4·11	204·74	300	261, 261
				Kith of Tregorland ..	Jr. 4 yrs.	14269	10.10.26	210	4	5,295	4 85	256 97	300	270, 286
				Irene of Tregorland ..	Jr. 4 yrs.	14265	20.10.26	210	4	3,900	4·73	184·30	300	309, 262
				Tregorland Ivoline	Jr. 2 yrs.	15594	22.10.26	273	..	4,593	4·19	192·43	200	
				Tregorland Trier	Jr. 2 yrs.	15603	24.10.26	273	9½	4,304	4·82	207·56	200	
J. T. Tweddle, Sunbury	3	3	Friesian	Burnbank Inka Segis Catriona	Jr. 3 yrs.	1809	8.10.26	240	7	7,208	3·79	273·26	250	233
				Burnbank Muller Patch ..	Sr. 4 yrs.	1817	16.10.26	210†	26½	10,785	3·61	389 76	325	376, 334
				Burnbank Inka Sylvia Violet	Mature	1106	21.10.26	210†	23½	10,845	4·39	475·60	350	297, 400, 578, 447

* Omitted from Annual Report, 1926-27. † Herd withdrawn from test.

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. T. Tweddle, Berwick	2	..	Friesian	Springfield White Posch ..	Mature	566	9.11.26	273	10	7,344	3·64	267·12	350	217, 296, 332, 404
				Burnbank Queen Patch ..	Mature	738	5.12.26	273	5	4,763	3·42	162·85	350	259, 345, 338
C. Wade, Camperdown	2	2	Jersey ..	Starbright of Colac ..	Jr. 2 yrs.	21730	21.10.26	273	18½	5,798	5.32	308·42	200	
				Beatrice of Merivale ..	Jr. 4 yrs.	15642	3.11.26	273	25	8,467	5·41	457·95	300	337, 380
A. Wallace, Bendigo	2	2	Ayrshire	Idol of Springdale	Jr. 2 yrs.	14276	6.10.26	273	15½	6,166	3·80	234·32	200	
				Dewdrop of Glen Cooee ..	Sr. 3 yrs.	11491	9.11.26	273	12½	7,419	4·10	304·22	275	230, 298
C. S. Walker, Swan Hill	1	1	Jersey ..	Preston Beauty	Mature	10527	13.12.26	273	25	8,082	4·37	352·97	350	332, 366, 453
Warragul High School, Warragul	4	2	Red Poll	Gipps Elaine	Sr. 2 yrs.	1280B	28.9.26	273	12½	6,706	3·81	255·40	225	167
				Gipps Iseult	Jr. 2 yrs.	1586A	6.10.26	273	6½	3,291	4·05	133·37	200	
				Gipps Guinivere	Jr. 2 yrs.	1726B	7.10.26	273	13½	5,329	4·20	223·70	200	
				Gipps Clorinda	Jr. 2 yrs.	1724B	24.10.26	273	9½	4,199	3·79	158·94	200	
H. L. Webb, Sunbury	3	2	Ayrshire	Connie of Glen Locksley ..	Mature	7979	23.10.26	273	19	8,660	3·86	334·68	350	
				Romance of Holly Green ..	Jr. 2 yrs.	14281	15.12.26	273	14½	5,594	4·14	231·60	200	
				Merit of Holly Green ..	Sr. 2 yrs.	12925	18.12.26	273	4	6,330	4·56	288·73	225	289
S. K. Webb, Neerim North	1	1	Jersey ..	Jessemia 16th of King's Vale	Sr. 4 yrs.	14117	22.11.26	273	..	7,528	5·84	439·89	325	261, 363

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
R. S. Williams, Kongwak	1	1	Jersey ..	Mona's Bonnie Girl of Linga Longa	Sr. 2 yrs.	C.R.	12.10.26	240	4	5,100	6·15	313·82	225	
A. C. Willis, Paschendale	1	..	Jersey ..	Morning Beauty of Clover Flat	Jr. 3 yrs.	21745	18.10.26	210	4	2,250	5·57	125·27	250	
W. Woodmason, Oakleigh	6	2	Jersey ..	Gaiety Girl 15th of Melrose ..	Sr. 3 yrs.	16786	1.10.26	273	8	4,295	6.14	263·79	275	217, 290
				Gipsy Love of Woodside ..	Mature	11257	13.10.26	273	16½	6,818	5·05	344·03	350	259, 324, 247
				Jessie 24th of Melrose ..	Mature	9888	13.10.26	273	12	6,861	4·95	339·71	350	311, 424, 466, 360, 449
				Jessie 43rd of Melrose ..	Jr. 3 yrs.	19036	8.12.26	273	17½	6,183	5·85	361·40	250	298
				Werribee Fancy Clemantine 2nd	Mature	10169	15.12.26	273	16½	6,788	5·49	372·76	350	
				Handsome Girl 12th of Melrose	Sr. 4 yrs.	19034	21.12.26	273	16	5,174	6·23	322·35	325	318
K. P. H. Young, Murrabit West	2	..	Ayrshire	Nellie 2nd of Gleneira ..	Jr. 3 yrs.	11770	28.9.26	273	9	5,636	3·79	213·44	250	
				Margueretа of Drayton ..	Mature	5104	14.11.26	273	..	6,208	4·14	256·73	350	

STALLION REGISTER 1927-28.

Under the "Horse Breeding Acts 1919-1925."

Part III.*—Registered from 1st October to 30th November, 1927.

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
760	Baron	A	Draught ..	Maguire, W. ..	Barwidgee Settlement
784	,, Laddie ..	A	,, ..	McLennan, A. ..	Derrinal
779	,, Minto ..	A	,, ..	Hermiston, W. (executors)	Mansfield
751	,, Style ..	A	,, ..	Browne, A. J. A.	"Mona Park," Werribee
785	Baron's Idol ..	A	,, ..	Carmichael, J., junr.	Mulwala, N.S.W.
783	Berwick, Victor ..	A	,, ..	McLeod, A. L. ..	Kyabram
781	Black Shepherd ..	A	,, ..	Simpson Bros. ..	Yambrina
759	Bold Boy ..	6	,, ..	Oxley, G. ..	St. Arnaud
745	,, Lad ..	A	Pony ..	Munsey, W. ..	Stanhope
786	,, McGregor ..	A	Draught ..	Doherty and McCarthy	Walpeup
744	Bonnie Belmont ..	A	,, ..	Watkins, J. T. ..	Euroa
766	Captain Douglas ..	A	,, ..	Rodda, C. S. ..	Warracknabeal
725	Clair's Pride ..	A	,, ..	Dean, T. J. ..	Landsborough
778	Colonel Douglas ..	5	,, ..	Jorgenson, A. C.	Katyil
728	Coma Knight ..	A	Pony ..	Nicholls, C. A. ..	Horsham
763	Crofthead, Douglas	6	Draught ..	Davies, H. ..	Bellarine
742	Culbo	3	Pony ..	Thomson, A. W.	"Monivar," Hamilton
796	Cyndett II. ..	A	,, ..	Marshall, C. T. ..	Vervale
762	Dalcrombie ..	6	Draught ..	Rumbold, J. ..	Laanecoorie
735	Domination ..	A	Pony ..	Lucas, C. T. ..	Pomborneit
780	Don Marvin ..	A	Light ..	Rousch, J. ..	236 Nicholson-st., Footscray
769	Dorregal Chief ..	A	Draught ..	Olsen, P. R. ..	Ultima
782	Fashion's Model ..	A	,, ..	Hamilton, A. B.	Fish Creek
756	First Voyage ..	A	Light ..	Minus, W. J. ..	Melton
765	Flash Jack ..	A	Draught ..	Mason Bros. ..	South Cannum
791	Gillies Son ..	A	,, ..	Boyd Bros. ..	Minhamite
795	Glen Dale ..	3	,, ..	White, C. ..	Yarra Glen
731	Gold Wash ..	A	Thoro'bred	Sutherland, A. ..	Welshpool
764	Grand March ..	A	Draught ..	Hughes, W. M. ..	Inglewood
772	His Majesty ..	A	,, ..	Frawley, M. ..	Leigh Creek
734	Humoresque ..	A	Pony ..	Bayley, A. C. ..	Willaura
737	Kelm Pride ..	A	Draught ..	Lippiatt, C. ..	Scotsburn
788	Kilmore ..	A	,, ..	Gribenoe, W. ..	Orbost
736	King Osterley ..	A	Light ..	Oates, S. ..	Cobden
776	Kingston ..	A	Draught ..	Nicol, R. P. ..	Yarram
777	Laird of Douglas ..	3	,, ..	Jorgenson, A. C.	Katyil
747	Lieutenant Mac ..	A	,, ..	Rowe, E. ..	Yarrowyah
801	Little Argyle ..	A	Pony ..	Lyon, W. H. ..	"The Grange," Salo
741	Lord Dalmuir ..	A	Draught ..	Mibus, G. E. ..	Moutajup
774	,, Waddington	A	,, ..	Baker, W. C. ..	Cheltenham
797	Lost Time ..	A	Thoro'bred	Martin, A. ..	Maffra

* For Part I.—Registrations up to the 31st July—see this *Journal* for October, and for Part II.—Registrations from 1st August to 30th September—see this *Journal* for November.

STALLION REGISTER, 1927–28—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
748	Lymn Loden ..	A	Draught ..	Emery, A. F. ..	Goomalibee P.O., Tarnook
770	Merry Chimes ..	A	Light ..	Hayes, W. A. ..	Hayesdale
739	Mountain Twig ..	6	Pony ..	Medlyn, J. H. ..	St. Arnaud
771	Palos	A	Light ..	Warren, R. ..	West Moolap
767	Percival Again ..	A	Draught ..	Richardson, P. G.	Pinnaroo
740	Right Dale ..	A	Light ..	Ovens, O. T. ..	Tatura
749	Rising Morn ..	6	Draught ..	Gillies, A. ..	Newmarket
800	Roy	A	Pony ..	Cleeland, J. B. ..	Newhaven, Phillip Island
799	Royal Chief ..	A	Draught ..	Burke, W. G. ..	Lemon Springs, Goroke
743	,, Saxon ..	A	,, ..	Beaumont, G. H.	Tatura
773	,, Sunbeam ..	4	,, ..	Ramsay, N. ..	Newbridge
758	Scotland's Signet	A	,, ..	Gillies, A. ..	Newmarket
750	Scottie	A	,, ..	Fullam, T., junr.	Torumbarry
738	Sea King ..	A	,, ..	McCready, A. ..	Gnarwyn, Ondit
798	Seymour ..	A	,, ..	Cleeland, J. B. ..	Newhaven, Phillip Island
753	Shepherd ..	A	,, ..	Warren Bros. ..	Stawell
775	Silverlight ..	A	Pony ..	Jarvis, R. J. ..	Cudgewa
733	Sir William ..	A	Draught ..	McClellan, W. A.	Bungaree
793	St. Aiden ..	A	Light ..	Cribbes, M. ..	Faraday
757	Stirling Prince ..	A	Draught ..	Cunning, A. ..	Beauchamp
732	Straightaway ..	A	Light ..	Allen, T. ..	Narrewillock, via Glenloth
729	Territorial ..	A	Draught ..	McKenzie, D. T.	Jack River
755	Thoughtful ..	A	Pony ..	McIntosh, P. ..	Ondit
761	Tim Anton ..	A	Thoro'bred	Coy, F. C., junr.	Bookar, via Camperdown
790	Tommy Dodd ..	A	Pony ..	Boyd Bros. ..	Minhamite
746	Tuxedo Rock ..	6	Light ..	Pell, A. ..	Kyabram
730	Vic McKinney ..	5	,, ..	Morris, C. ..	Upper Ferntree Gully
789	Vulcan	A	Pony ..	Boyd Bros. ..	Minhamite
754	Wee Key ..	A	,, ..	Kirkwood, R. ..	Byaduk North, via Hamilton
792	Young Linkwood	A	Draught ..	Hando, A. ..	Woosang
752	,, McLoish ..	A	,, ..	Charlton, Jas. ..	Stony Creek

List of stallions in respect of which certificates of registration have been refused but which, the owners having paid the prescribed fees, may be retained for breeding purposes with owners' own mares only:—

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
..	Baron Bellum ..	6	Draught ..	Coy, F. C. & Co...	Woorndoo
..	Baron Mac ..	3	,, ..	Gardner, R. ..	Katamatite
..	Carmichael II. ..	3	,, ..	Hanlon, D. ..	Benalla
..	Clyde	A	,, ..	Hebard, C. ..	Bulart, via Cavendish

Stallions Refused Certificates—*continued.*

Cert No.	Name	Age.	Class.	Owner.	Address.
		Yrs.			
..	General Link ..	5	Draught ..	Echardt, J. H. ..	Beulah
..	King Cedric ..	A	„ ..	McNabb, G. A.	Irrewillipe East
..	Newton Stuart ..	3	„ ..	Tarrant, G. B. ..	Tempy
..	November ..	3	Light ..	Ramage & Mason	Violet Town
..	Nugget II. ..	A	Draught ..	Lord, Geo. ..	Eskdale
..	Ondit	5	„ ..	Executors of Thornley, N.	Hawkesdale
..	Royal Dobbin ..	4	„ ..	Storer, G. ..	Manangatang
..	Scotchdale ..	3	„ ..	Walsh, J. ..	Horsham
..	Scotlands Duke ..	3	„ ..	Quick, H. F. ..	Box 19, Brim
..	Viceroy ..	4	„ ..	White, W. T. ..	Yaapeet

BROWN ROT OF APPLES.

The following interesting article by Mr. H. Wormald, D.Sc., A.R.C.Sc., of the Horticultural Research Station, East Malling, Kent, England, should be of interest to local apple producers.

In recent years, the brown rot disease of fruit, caused by *Sclerotinia fructigena,* has been very prevalent. The disease was particularly severe in 1926, and it was not only common on apples and pears, the usual hosts of this fungus, but considerable loss in the plum crop resulted from infection by the same parasite.*

So far as is known, primary infection of the fruit by *Sclerotinia fructigena* takes place only through wounds, such as those caused by biting insects, but, when one apple of a cluster becomes infected, the disease can extend from that apple to those touching it across the points of contact. The fruit may be infected when young and growing, and also at maturity, while infection may also take place at the time of picking or during the subsequent handling. The disease is the most common cause of loss in apples during the early stages of storage, and the so-called "black rot" of stored apples is caused by the same fungus. As mechanical injury renders the fruit so liable to infection, it is obvious that, especially in years of epidemic infestations, care must be taken not to cause unnecessary injury when the fruit is picked and afterwards when it is graded and packed or stored.

One form of injury may occur at the time of picking by removing the fruit from its stalk instead of picking it with the stalk attached. That injury of this kind may soon lead to loss in the crop is shown by observations made at East Malling in the autumn of 1926.

Early in September, as the apples were being picked and graded for packing and marketing, it was noticed that fruit, apparently quite

* A closely related fungus, Sclerotinia cinerea, also causes brown rot of plums and cherries; in addition to causing fruit rot, it infects the flowers and so produces blossom wilt.

sound when received from the pickers, showed very pronounced brown rot within two or three days. On investigation it was found that in nearly every instance the rot had started at the stalk end, and this condition only appeared on those apples which had been pulled away from the stalk when picked. Observations were made on a batch of apples which had been picked three days previously, and already a number of those without stalks showed the typical brown rot, the discolouration in some cases extending for ½ inch or more from the stalk end wound.

The variety in which this type of injury was observed was "James Grieve," which is not only very susceptible to brown rot infection of the fruit, but, being a soft-wooded variety, the rot often extends from the fruit into the spurs and also into the branches to form cankers.

To obtain some idea of the rate at which rot progresses in fruit infected in this way, apples showing rot starting at the stalk end were selected. The margin of the brown area in each case was then marked with ink. The apples were placed on a bench in an unheated laboratory, the temperature of which was approximately that of the packing shed.

On the following day it was found that the rot had extended 7 to 16 mm. (on the average about ½ inch) beyond the marked line within the 24 hours. During the next 24 hours the rot proceeded at about the same rate, so that nearly half the surface of each apple was brown, and a few yellowish spore-bearing tufts, the fructifications typical of the fungus, were appearing at this stage. A few days later the apples were completely brown, and numerous fructifications were present. It is obvious that the apples had become infected soon after they were picked, and that the fungus had entered through the wound caused by removing the fruit from the stalk.

It is apparent also that had these apples been sent to market, when they already showed evidence of infection, they would have been unsaleable soon after their arrival. However carefully apples are picked, a certain number will be pulled away with damaged "strigs." During grading these should be set aside with the bruised fruit for immediate use. Such fruit should not be stored. Slight injuries in themselves are not necessarily very harmful, but, since they serve as ports of entry for certain parasites, such as the one under consideration, care in picking, grading, and packing is essential for successful storing and marketing of fruit. Since it is impossible to eliminate mechanical injuries altogether, especially when large quantities of fruit have to be handled, the grower should endeavour to reduce the chances of infection to a minimum by removing as far as possible all sources of infection. In certain seasons it is not uncommon, at the time of picking, to see the ground under apple and pear trees strewn with fruit infected with brown rot and bearing myriads of spores which blow about and cause further infection. The collecting of such fruit and rendering them innocuous by burning or burying is possible in a garden or small plantation, but is hardly a practical proposition on large fruit farms.

The grower, however, should realize that rotting fruits, whether on the tree or on the ground, are a source of danger, and when it is at all practicable they should be destroyed. He is reminded, too, that

apples infected with brown rot frequently remain on the tree through the winter. These "mummies," if left on the trees, produce, in the following spring, another crop of spores which serve to start infection in the young fruit. It is, therefore, sound practice to remove, during the winter, any withered apples that may be found on the trees.

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

As a preventive against codlin moth, apple and pear trees should be sprayed with arsenate of lead whenever there is danger from the prevalence of the moth. One of the secrets of success in codlin moth spraying is the destruction of as many as possible of the insects of the first brood. Thus, if particular care is given to the early sprayings, keeping the fruit covered with spray for a month or six weeks after setting, this result is easily accomplished. Some growers prefer to gather all fruit infected by the first brood, spraying only for the second and later broods. Even if all the fruits attacked are gathered, which very rarely happens, the grower suffers from the loss of fruit, which he can ill afford, unless his crop be a heavy one.

Another feature for consideration is the fact that the presence of any arsenical spray on the foliage is responsible for the destruction of the pear and cherry slug, root-borer beetle, and all forms of leaf-eating insects.

Spraying the cherries for the slug will now be necessary. Arsenate of lead may be used, provided the fruit is not far advanced. Hellebore, and also tobacco water, are effective against this pest.

Cultivation.

All orchard soils should be kept well worked during the summer months. It is very essential that the trees should have an abundant supply of moisture during the whole of the growing season. This will mean an increased supply of fruit buds for the next season, consequently the frequent summer cultivation of the soil will be a necessity if the health and vigour of the trees are to be maintained.

Excessive transpiration is often the cause of loss of young trees and of new grafts. They are found to part with a large amount of moisture, and are not able to obtain or retain sufficient for their nourishment: they then very soon wither and die. The soil around these should always be kept well stirred; they may also be given a good straw or grass mulching, and an occasional overhead sprinkling will greatly benefit them.

The planting out of citrus trees may be continued, sheltering the tender plants from winds with hessian or breaks of scrub.

The general aims in summer cultivation should be to maintain a good loose earth mulch during the whole season, and to keep down all weeds and useless orchard growths.

Pruning.

Summer pruning may now be commenced, particularly on apple, pear, and plum trees. The removal or reduction of surplus leader growths, the shortening of unduly long laterals, and the thinning out of crowded shoots, will all tend to strengthen other parts of the tree and to increase the development of new fruit buds.

The Vegetable Garden.

Tomatoes will require much attention at this time of the year. If the plants have been well looked after, they should be making vigorous growth. It will be to advantage to tie the plants to stakes, training them to two or three main growths, and pinching out all laterals as they come.

The plants should be well watered, and occasionally a handful of bonedust or potash mixed should be forked in around the roots. Where stable manure is used, it should be used as a mulch, forking it in every three or four weeks, and making a fresh mulch.

It is now recommended that occasional doses of sulphate of potash as a manure for tomatoes will help the plants to resist the spotted wilt.

All plants of the cucumber and melon family should now be constantly supplied with ample water. Pinch out unnecessary lateral growths, and also the terminals.

The following seeds may now be sown:—French beans, cabbage and cauliflower for winter crops, parsnip, lettuce, and celery.

The side shoots of celery plants should be removed, afterwards earthing up the plants. Asparagus beds should be top-dressed, and allowed to grow without any more cutting. The vegetable beds will need frequent forking and hoeing to keep the soil sweet, and to keep down all weeds.

The Flower Garden.

Plant out dahlias this month; green plants early, and plants grown from tubers later in the month. Water well at planting, and keep well cultivated afterwards.

Rose bushes and beds may be given a good mulch with light stable manure, straw, grass, or lawn clippings. The beds should be kept rather dry, so as to allow the plants to rest before the autumn period of growth.

Sow seeds of cosmos, asters, zinnia, balsams, cockscomb, coreopsis, salpiglossis, and other late summer and autumn blooming annuals.

Cut down delphiniums that have yielded their first crop of flowers, so as to allow a succession of flowers to come.

Daffodil, hyacinth, tulip, ranunculus, anemone, and other bulbs and tubers may be taken up and stored; while gladioli corms may still be planted.

The garden must be kept well watered and cultivated, so as to tide the plants over the hot and dry season.

REMINDERS FOR JANUARY.

LIVE STOCK.

HORSES.—*Stabled.*—Over-stimulating and fattening foods should be restricted. Water should be allowed at frequent intervals. Rub down on coming into stables in an overheated condition. Supply a ration of greenstuff, where possible, to all horses. *Brood mares* should be well fed on succulent food if available; otherwise, oats and bran should be given. *Foals* may with advantage be given oats to the extent of 1 lb. for each month of age daily. Provision should be made for shade shelter for paddocked horses.

CATTLE.—Provide succulent fodder and plenty of clean water and shade. Japanese millet makes good grazing when the grass is dry. There should always be a supply of silage. The silo may be filled twice a year, and so a supply of succulent fodder is always available. Provide "lick" in trough, consisting of salt 40 lb., bone flour 20 lb., sulphur 15 lb., lime 25 lb., potassium iodide 5 oz. Limewash the cow bails, it helps to keep down flies. Provide calves, if possible, with good grass run, or lucerne hay or oats in a trough. Now that the Dairy Produce Act is in operation, it is necessary to take proper care of milk and cream, as it must be paid for according to its quality. Utensils must be kept clean and well tinned. Cream must be cooled and kept cool and delivered fresh to the factory. Write to the Department of Agriculture for "Don'ts for Dairymen."

PIGS.—Supply short bedding in well-ventilated styes. Keep styes clean and dry, and feeding troughs clean and wholesome. Sows suckling young should be well fed to enable them to produce plenty of milk. Give young pigs pollard and skim milk in separate trough as soon as they will take it, and keep them fattening from the start to get them off as early as possible. Give a tablespoonful of bone meal per 100 lb. live weight in food daily. If pigs are lousy, dress with kerosene emulsion or sulphur and lard, rubbing well into crevices of skin, and disinfect styes. Plenty of water should be available for them to wallow in in hot weather, also clean water to drink.

The automatic feeder described and illustrated in Bulletin 16 is proving a great success, and should be adopted in connexion with grazing.

SHEEP.—The various breeds of ewes come in season approximately as follows:—Merinoes and comebacks, November and December; crossbreds, January and February; pure British breeds, February and March. These dates will vary with the locality, e.g., in the north of Victoria ewes generally come in season from one month to six weeks earlier than in the south-western districts or in South Gippsland. Be sure that there are ample rams, that is to say, from 2 to 3 per cent. If possible, use 2, 4, or 6-tooth rams. If older rams are used, it is preferable to join them with young ewes, and rams should be in proportion of 3 per cent. Always select rams with width and substance, true to breed, with type and wool qualities pronounced. (Do not use crossbred or mongrel rams. Pure-bred rams will produce better lambs.) If an ample number of rams be available, use the best first and the seconds afterwards. The mating period should not exceed eight weeks. It is well to have fresh rams after the first five weeks. The ewes should be in good condition at mating time, but not too fat. To start the rams working, yard the ewes with the rams for a few nights at the outset of joining. The ewes will come into season much quicker if flushed with good food just before joining the rams.

Breed from only good-fleeced, roomy, and sound-mouthed ewes. Keep in view wool-production as well as a good-shaped carcass. Lamb, mutton, and wool will be amongst the foremost commodities in Australia for some time to come, and with the prices ruling for these products at present, every sheep-owner should make determined efforts to improve his flock. Two-tooth ewes, if well-grown, may be bred from; this particularly applies to crossbreds and pure English sheep; also to the two-tooth ewes of a Merino flock if they are large enough, but they must be well treated throughout.

The second dipping of tick and louse infected sheep should be undertaken during January, but care should be taken not to dip during very hot weather.

Where the grass is dry and hard, all ewes that are hollow and "off their feed" should be given a purgative drench or pill. If weaners are scouring, worm-pill or drench should be given. Grown sheep showing unhealthy discharge should be given a worm drench.

To make a suitable drench, dissolve 8 oz. of bluestone in 4 gallons of water The following doses may be given:—

Adult sheep	2 oz. of solution.
Yearlings	1½ oz. of solution and ½ oz. water.
Six months	1 oz. solution and 1 oz. water.
Lambs	½ oz. solution and 1½ oz. water.

Attend to health of sheep generally. Do not overstock. Ensure an ample fresh-water supply. Healthy well-fed sheep rarely get fly-blown.

Poultry.—Separate the sexes; the cockerels should now be fattened and marketed. Grade the young stock according to age and size, otherwise the younger birds will not thrive. Avoid overcrowding. Do not force pullets too much with animal food; build them up with a good variety of food, and give but little meat. Increase the green food; thoroughly spray houses and perches with an emulsion of kerosene and soapsuds, or a solution of carbolic acid 1 in 60. Keep water vessels in shady spot, and renew water twice daily.

BEEKEEPING.

January being usually the hottest month of the year, combs may melt down on very hot days in hives made out of cases unless they are in some way shaded during the hottest part of the day. If bags are used, they should be removed again as soon as the hot weather is over, because they afford hiding places for bee moths, spiders, and other enemies of bees.

With factory-made or other hives, the walls, cover, and floor of which are of timber not less than ⅞ inch in thickness, there is no need to provide artificial shade, provided the entrance is of sufficient width and the hive of ample capacity to accommodate the bees. The ordinary entrance, which is 5-16 inch deep and the width of the hive, is generally sufficient. It may, however, be enlarged by raising the hive another ¼ inch or so in front should there be much clustering out of the bees.

Top ventilation should not be given; it is not necessary, and the bees dislike it. Bees control the temperature inside the hive by fanning at the entrance and by moistening the combs with water.

During this and the next month bees generally supersede queens in their third year, or which are failing during the second. Queens are sometimes still quite prolific, but by some means the bees know that they would not live through the coming winter, and that it is necessary to raise a successor while drones are still flying, so that the young queen may not remain unfertilized. The queen-cells, which bees construct when superseding, are few—one or two, rarely more. They are generally built on the face of one of the outer combs, often one containing no other brood—not on the edge of a brood comb, as in the case of swarm cells.

Supersedure queen cells must not be mistaken for swarm cells and destroyed, otherwise the hive may eventually become queenless.

All colonies should be examined to see that each has a laying queen. It sometimes happens that the virgin queen of a swarmed stock is lost on her mating flight, and as there is then no young brood in the hive from which to raise another queen, the colony becomes hopelessly queenless. Therefore, whenever neither young brood nor eggs are seen in a hive, a comb of young brood or eggs from some other colony should be given to the bees. If, on examination a few days later, queen-cells have not been raised, then there is a virgin queen in the hive which may be expected to commence laying within a fortnight at the outside.

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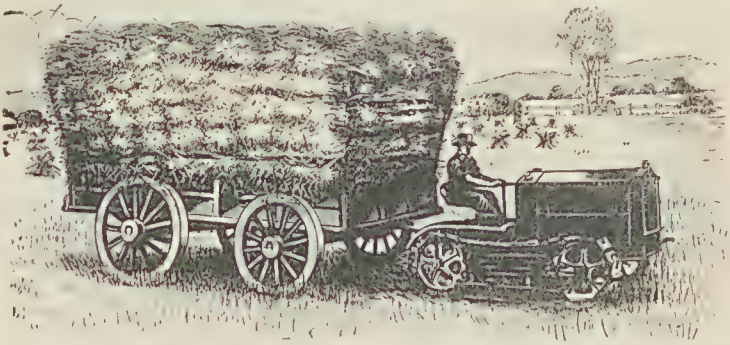

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For 1928

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Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter *fat* yielded. Thus a calf from a cow with a 400 lb. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

SIRES IN USE:

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lb.; 1917, 398 lb.; 1918, 419 lb.; 1919, 479 lb.; 1920, 428 lb.; 1921, 562 lb.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking) 7144 lb. milk.

Dam's Dam's	,,	14533 lb. milk	...	4	years	average	12871 lb. milk.		
Sire's Dam's	,,	10370	,,	...	7	,,	,,	9354	,,
Sire's D. Dam's	,,	9510	,,	...	12	,,	,,	8033	,,
G. Sire's D. Dam's	,,	10215	,,	...	7	,,	,,	9386	,,
G.G. Sire's D. Dam's	,,	12565	,,	...	10	,,	,,	8853	,,
G.G.G. Sire's D. Dam's	,,	10088	,,	...	2	,,	,,	9754	,,

BIT O' 'BACCA (Vol. 3)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Nictitana (311 B.) by Nicotine (69 A.A.).

Nictitana's butter fat records for 6 successive lactation periods are as follow:—1918, 450 lb.; 1919, 396 lb.; 1920, 393 lb.; 1921, 465 lb.; 1922, 524 lb.; 1923, 536 lb.

Inspection of the Herd is Invited.

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GOVERNMENT TOURIST BUREAU

QUEEN'S WALK (opp. Town Hall), MELBOURNE
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